SEPTEMBER 12, 1936

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. XI., OF VOL. II., 1936. LONDON, SATURDAY, SEPTEMBER 12, 1936. Pp. 112—Price 1s.
No. 5898. VOL. CCXXXI. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

FIVE NEW BOOKS

STARLING'S PRINCIPLES OF HUMAN PHYSIOLOGY. *7th Edition.* Revised by C. LOVATT EVANS, D.Sc., F.R.C.P., F.R.S. 554 Illustrations, 6 in Colour. 24s.

MODERN TREATMENT OF DISEASES OF THE RESPIRATORY SYSTEM. By A. LISLE PUNCH, M.B., M.R.C.P., and F. A. KNOTT, M.D., M.R.C.P. 96 Plates and 31 Text-figures. 15s.

TAYLOR'S PRACTICE OF MEDICINE. *15th Edition.* Edited by E. P. POULTON, D.M., F.R.C.P. 71 Plates (16 Coloured) and 104 Text-figures. 28s.

RECENT ADVANCES IN ENDOCRINOLOGY. By A. T. CAMERON, D.Sc., F.I.C., F.R.S.C. *3rd Edition.* 65 Figures, including 3 Plates. 15s.

RECENT ADVANCES IN RADIOLOGY. By PETER KERLEY, M.D., B.Ch., D.M.R.E. *2nd Edition.* 176 Illustrations. 15s.

J. & A. CHURCHILL LTD.

ANATOMY IN THE LIVING MODEL
By DAVID WATERSTON, M.A., M.D., F.R.C.S.E., F.R.S.E.,
Bute Professor of Anatomy at the University of St. Andrews.
276 pages. 74 illustrations. 16 coloured plates. Price 15s. net, postage 9d.
". . . can be read and re-read by the student, general practitioner, the surgeon and physician."
—ST. BARTHOLOMEW'S HOSP. JOUR.
Hodder & Stoughton Medical Publications, 20, Warwick-square, London, E.C.4.

SECOND EDITION.

UROLOGY IN WOMEN:
A HANDBOOK OF URINARY DISEASES IN THE FEMALE SEX.
By E. CATHERINE LEWIS, M.S. (Lond.), F.R.C.S. (Eng.), Surgeon to the Royal Free Hospital; Surgeon and Urologist to the South London Hospital for Women.
¶ *"This book should certainly make and keep for itself a place in urological literature."*—LANCET.
Pp. viii + 100. With 4 Coloured Plates and 27 other Illustrations. Price 6s.; postage 5d.; abroad 9d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

FOURTH EDITION. Completely revised. 10s. 6d. net.

TREATMENT OF DISEASES OF THE SKIN
By KNOWSLEY SIBLEY, M.A., M.D., B.Ch. (Camb.).
London: Edward Arnold & Co., 41 and 43, Maddox-street, W.1.

OESOPHAGEAL OBSTRUCTION:
ITS PATHOLOGY, DIAGNOSIS AND TREATMENT
(including four chapters on Cancer of the Œsophagus).
By A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to the Cancer Hospital, &c.
Pp. 245. 132 Illustrations. 2 Col. Plates. 30s. net.
"Masterful and complete. . . Cannot be too highly praised."
—SURG. GYN. AND OBSTET. JOUR.
Oxford University Press, Amen House, London, E.C.4.

JUST PUBLISHED. 129 Illustrations (10 Coloured), 12s. 6d. net; postage 6d.

DISEASES OF THE TESTICLE.
By HAMILTON BAILEY, F.R.C.S.
London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C.1.

THE HYGIENE OF
THE CHANGE IN WOMEN
(The Climacteric)
By ISABEL EMSLIE HUTTON, M.D.
(Author of "The Hygiene of Marriage").
Crown 8vo. 5s. net.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

2nd Ed., fully revised, in 1 Vol., 854 pp. 811 Illus.

EMERGENCY SURGERY. 50s. net; postage 8d.
By HAMILTON BAILEY, F.R.C.S.
BRISTOL: JOHN WRIGHT & SONS LTD. LONDON: SIMPKIN.

FRACTURES.
By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.).
With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.
Pp. 550. 337 X ray photographs, photographs and diagrams. 24s. net.
Constable & Co. Ltd., London.

DISEASES OF THE THYROID GLAND.
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully Illustrated. £3 3s. net.
"No praise is too high for the author of this great book. It must be considered as the standard work on thyroid disease. Its pages summarise all that is known of this most interesting subject at the present day."—WEST LONDON MEDICAL JOURNAL.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

PROBLEMS OF
ANÆSTHESIA
IN GENERAL PRACTICE
By D. H. LUKIS, M.D., B.S. Lond.
Late Hon. Anæsthetist, South London Hospital; late Clinical Assistant, Ear, Nose, and Throat Department, Queen's Hospital for Children, and Hon. Medical Officer, Kingston Victoria Hospital.
Demy 8vo. 7s. 6d. net (postage extra). 158 + vi pages.
Hodder & Stoughton, Ltd. (Medical Publications), Warwick-square, E.C.4.

"Should be in the possession of every medical man."
—GLASGOW MEDICAL JOURNAL.

URINARY SURGERY
A Handbook for the General Practitioner.
By W. K. IRWIN, M.D., F.R.C.S.,
Surgeon, St. Paul's Hospital for Genito-Urinary Diseases.
"Clearly written . . . furnishes the practitioner with information of great practical value in his everyday work."—BRIT. MED. JOUR.
SECOND EDITION, REVISED AND ENLARGED.
Price 10s. 6d. (postage 6d.).
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

A NEW BOOK BY TWO DISTINGUISHED AUTHORS

DISEASES OF THE AIR AND FOOD PASSAGES OF FOREIGN-BODY ORIGIN

By CHEVALIER JACKSON, M.D., Sc.D., LL.D., F.A.C.S., Professor of Bronchoscopy and Esophagoscopy, Temple University; and CHEVALIER L. JACKSON, A.B., M.D., Professor of Clinical Bronchoscopy and Esophagoscopy, Temple University. Octavo of 1,000 pages, with 2,000 illustrations. Cloth, **52s. 6d.** net.

SAUNDERS, PUBLISHERS
7, GRAPE ST., LONDON, W.C.2

COLLEGE OF SURGEONS
SEP 23 1936
MEDICAL DIVISION

ELIXIR

Bromo - Valerianate

GABAIL

exerts a profound influence on the exhausting sweatings and flushings, the nervous irritation and depression, mental excitability, restlessness, and 'anxiety neuroses' associated with the

MENOPAUSE

Dose: One tablespoonful twice or thrice daily.

Supplied in bottles of 187 c.c.

Literature and Samples on request from:—

THE ANGLO-FRENCH DRUG CO. LTD.
11 & 12, Guilford Street, LONDON, W.C.1

99

METAPHEDRIN INHALANT No. 99

Ephedrine 0.95 **Metaphen 1 : 2500**

Used topically in the treatment of the Common Cold, is efficient for inhibiting infection and shrinking the congested nasal mucous membranes. It is soothing and yet so bactericidal that there is no danger of carrying infection into the sinus.

Medical Practitioners are invited to write for a sample:—

ABBOTT LABORATORIES LTD.,
52a Wigmore St., London, W.1.

BRONCHOSPASM AND ASTHMA

A booklet surveying this subject, which includes diagrams and illustrations, has recently been published and has been sent to all members of the Medical Profession. You are invited to send for a copy should this have failed to reach you.

"THE LANCET" writes (28/4/34, p. 929):—

"We have received a pamphlet on 'Bronchospasm and Asthma,' written to bring before the medical profession the value of Felsol in the treatment of asthmatic subjects. The powders can be prescribed by the medical man in accordance with the definite régime which he decides to adopt in the treatment of a case, the claim for felsol being that its administration relieves promptly the attack of asthma by its influence over bronchial spasm, so that only the most severe cases would require the injection of morphia."

Telephone: Museum 2855

BRITISH FELSOL COMPANY LTD.
15, Caroline Street, London, W.C.1

Telegrams: Felsol, Westcent, London

SEPTEMBER 12, 1936

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 5898 LONDON: SATURDAY, SEPTEMBER 12, 1936 CCXXXI

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Treatment of Industrial Injuries. By DONALD STEWART, M.R.C.P.—(*With Charts*) 609

Chronic Rheumatism: Significance of Infection in Individual Groups. By J. W. T. PATTERSON, F.R.C.P., and H. B. SALT, A.I.C. 613

An Experiment in X Ray Pelvimetry. By C. NICHOLSON, M.D.—(*Illustrated*) 615

Treatment of Recurrent Nasal Polypi with Radium. By W. G. SCOTT-BROWN, F.R.C.S.—(*Illustrated*) 619

Coarctation of the Aorta with Toxic Goitre Treated by Complete Thyroidectomy. By HAROLD COOKSON, M.R.C.P.—(*Illustrated*) .. 623

Medicothorax: A New Form of Artificial Pneumothorax. By VILMOS MULLER, M.D.—(*Illustrated*) 625

Congenital Total Colour-Blindness. By A. M. MACGILLIVRAY, M.D., D.O.M.S., and A. SHEILA MACLEOD, M.B. 626

REVIEWS AND NOTICES OF BOOKS

Population Movements. By R. R. Kuczynski 634

World Population: Its Growth and Present Trends. By A. M. Carr-Saunders 634

The Struggle for Population. By D. V. Glass .. 635

Text-book of Pathology. By Sir Robert Muir, M.D., F.R.S. 635

Vitamins and other Dietary Essentials. By W. R. Aykroyd, M.D. 635

Manual of Practical Obstetrics. By O'Donel Browne, F.R.C.P. 635

Infant Speech. By M. M. Lewis, M.A. 636

LEADING ARTICLES

IMPACT OF SCIENCE ON SOCIETY 637

SURGERY OF ŒSOPHAGEAL CANCER 638

THE SHERLOCKIAN METHOD IN EPIDEMIOLOGY 639

ANNOTATIONS

Ships as Houses 640

Efficacy of Gargles 639

Flavon and Capillary Permeability 640

Total Colour-Blindness ... 640

Air-borne Threadworm Infection 641

Progestin and Uterine Contractions 641

Permeability of the Skin .. 642

Bread 642

Histidine in the Relief of Pain in Peptic Ulcer .. 643

Arthritis and the Mind .. 643

PROGNOSIS

CXIII.—Carcinoma of the Lung. By ANDREW MORLAND, M.R.C.P. 644

PANEL AND CONTRACT PRACTICE

Burden of Sickness Upon Industry 651

PUBLIC HEALTH

Typhoid After Camping .. 654

Infectious Disease in England and Wales.... 654

NEW INVENTIONS

New Uterine Dilator. By T. F. TODD, F.R.C.S.—(*Illustrated*) 636

SPECIAL ARTICLES

Slum Clearance at Sea. By J. GREENWOOD WILSON, F.R.C.P.—(*With Chart*) 645

British Medical Association: Sections of Medicine and Surgery: Surgery of Pulmonary Tuberculosis 627

Section of Pharmacology and Therapeutics with Anæsthetics: Present Status of Cyclopropane 629

Section of Oto-rhino-laryngology: Otomicroscopy: Hearing Aids 630

Section of Nutrition: Disease and Diet 633

Medicine and the Law: Inquests and Police Prosecutions 659

Ireland: The Census 652

Paris: Public v. Private Hospitals—Control of Sale of Drugs—Medical Examination of Candidates for Naturalisation 652

British Postgraduate Medical School: Courses of Lectures for 1936–37 .. 653

GRAINS AND SCRUPLES

From a Doctor Without Patients 649

CORRESPONDENCE

Infringement of the Civil Rights of Experts (Mr. R. T. Payne, F.R.C.S.) 658

The Earnings of Women Practitioners (Dr. E. D. Fenwick and Mrs. H. E. Davenport, M.R.C.S.) .. 658

Safe Catgut (Mr. E. J. Holder) 659

THE SERVICES

Royal Naval Medical Service—Royal Army Medical Corps—Royal Air Force—Indian Medical Service—Colonial Medical Service 654

OBITUARY

Lord Moynihan, K.C.M.G.—(*With Portrait*) 655

George William Neild Joseph, M.D. 657

Archibald Douglas Hamilton, M.D. 657

William John Taggart, M.B. 657

Clement Sturton, F.R.C.S. 658

MEDICAL NEWS

University of Birmingham 659

Middlesex Hospital 659

Medical Peace Campaign .. 659

King's College Hospital .. 659

Westminster Hospital 659

Central London Throat, Nose, and Ear Hospital 659

British College of Obstetricians and Gynæcologists 660

Royal Sanitary Institute .. 660

Institute of Medical Psychology 660

Exhibition of Smoke Abatement 660

A Clinic for Diabetic Children 660

Leeds Public Dispensary and Hospital 660

Grocers' Company Scholarships 660

Preston Royal Infirmary .. 612

Southend General Hospital 654

Spittlesea Isolation Hospital, Luton 664

Scarborough's New Hospital 664

NOTES, COMMENTS, AND ABSTRACTS

Natural Selection and Evolutionary Progress.. 661

Hypertension at Various Ages 662

The Work of a Malaria Unit..... 662

Cancer and Tuberculosis .. 663

Treatment of Drug Addiction 663

Vacancies 660

Medical Diary 664

Appointments 664

Births, Marriages, Deaths 664

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

President: Sir CUTHBERT S. WALLACE, K.C.M.G., C.B., P.R.C.S.

Trustees for the Reserve Fund:

Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., P.R.C.P.

Sir SQUIRE SPRIGGE, M.D., F.R.C.P., F.R.C.S. Sir NORMAN G. BENNETT, M.A., M.B., B.Ch., L.D.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in respect to actions, etc., undertaken on their behalf.

The Society is insured with Lloyd's Underwriters to an UNLIMITED extent in respect of all adverse costs and damages awarded against Members in any action which the Society undertakes on their behalf.

Annual Subscription: £1. Entrance Fee: 10s. Assets exceed £70,000.

No entrance fee to those joining within 12 months of registration.

Full particulars and forms of application for membership from the Secretary, Victory House, Leicester Square, W.C.2.

Telephone: GERRARD 4814.

ALCOHOLISM IN GENERAL PRACTICE

Part I: Psychology and Management. By A. E. CARVER, M.A., M.D., D.P.M. (Camb.) Medical Director, Caldecote Hall.

Part II: General and Physical Effects. By THOMAS HUNT, B.A., D.M. (Oxon.) F.R.C.P. (Lond.) Physician to Out-patients, St. Mary's Hospital, London.

Part III: Medico-Legal Aspects of Chronic Alcoholism. By Sir WILLIAM WILLCOX, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P., Consulting Physician to St. Mary's Hosp., London.

In One Volume, with Index. Price 7s. 6d. net.

Prospectus post free from the Publishers:

CONSTABLE & CO. LIMITED 10 ORANGE STREET LONDON W.C.2

The Prescriber

A Review of the Progress of Medical Science.

Published MONTHLY—20s. per annum, post free.

SEPTEMBER, 1936

FULL REVIEW ON MALARIA, GIVING LATEST ADVANCES IN TREATMENT

Price 2s. 0d. post free.

THE PRESCRIBER OFFICES, 65, Castle Street, EDINBURGH, 2.

STAMMERING, SPEECH DEFECTS.

BEHNKE METHOD. Estab. 1880. CASES, non-resident, treated at 39, Earl's Court-square, S.W.5, and, in residence, in the Summer Holidays at Miss Behnke's house on the Chilterns.

"Pre-eminent success in the education and treatment of stammering and other speech defects."—*The Times.*

"Thoroughly physiological principles."—*The Lancet.*

"The method is scientifically correct and perfectly effective."—*Guy's Hospital Gazette.*

"STAMMERING, CLEFT PALATE, SPEECH LISPING." 3s. 9d. of Miss BEHNKE, 39, Earl's Court-square, S.W.5.

Recently Published. SECOND EDITION. Fully revised. Large 8vo. 490 pp. With 14 Coloured Plates and 297 Illustrations. 30s. net, postage 6d.

CYSTOSCOPY AND UROGRAPHY

By JAS. B. MACALPINE, F.R.C.S.
Honorary Surgeon and Surgeon in Charge of the Genito-Urinary Department, Salford Royal Hospital, Manchester.

"This book is a remarkable achievement; we consider it to be one of the best monographs we have ever read."—*British Journal of Surgery.*

"The best book in the English language dealing with cystoscopy and urography."—*The Medical Press and Circular.*

FIFTH EDITION. Fully revised. Large 8vo. 300 pp. With 341 Illustrations, some of which are in colour. 21s. net, postage 6d.

DEMONSTRATIONS OF

PHYSICAL SIGNS IN CLINICAL SURGERY

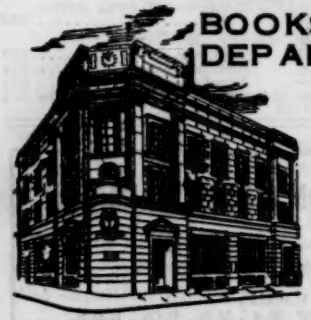
By HAMILTON BAILEY, F.R.C.S. (Eng.)
Surgeon, Royal Northern Hospital, London.

"An admirable book which we can recommend to all students."—*British Journal of Surgery.*

"A valuable collection of practically all the recognised signs used in clinical surgery."—*British Medical Journal.*

Bristol: JOHN WRIGHT & SONS LTD. London: SIMPKIN MARSHALL LTD.

H. K. LEWIS & Co. Ltd., Publishers and Booksellers



BOOKSELLING DEPARTMENT } TEXTBOOKS and Works in Medical, Surgical, and General Science. **FOREIGN BOOKS.**

STATIONERY DEPARTMENT.—Special Stock of Medical Stationery, Card-Index Systems, Filing Cabinets, Name Plates, Notebooks, etc. Hand-painted Shields of the Arms of Universities, Hospitals, and Colleges. All Students' Requisites.

MODELS DEPARTMENT.—Anatomical Models, Charts, Osteology, etc.

MEDICAL AND SCIENTIFIC LENDING LIBRARY

Annual Subscription, from ONE GUINEA. *Prospectus on application.*

SECOND-HAND BOOKS DEPARTMENT: 140 GOWER ST., W.C.1

London: H. K. LEWIS & Co. Ltd., 136 Gower Street, W.C.1.

Telegrams: "PUBLICAVIT, WESTCENT, LONDON." *Telephone:* MUSEUM 7756-7-8

STAMMERING

The **BEASLEY SYSTEM** has been employed with unvarying success for the past 60 years, and still provides the most EFFECTIVE treatment. The method is based on the most simple and natural lines possible. Nothing is experimental.

This treatment is now being carried on by a former pupil (with the consent of the late Mr. Beasley's family) at Bridge Close, Marlow-on-Thames, where resident pupils are received at any time. Non-resident pupils may be treated at Cavendish-square, London.

Apply, A. DUFAUR CLARK, 17, Cavendish Square, London, W.1

ADDRESSES AND ORIGINAL ARTICLES

TREATMENT OF INDUSTRIAL INJURIES*

By Donald Stewart, M.D., M.R.C.P. Edin.
MEDICAL OFFICER, METAL GROUP, IMPERIAL CHEMICAL INDUSTRIES, LIMITED

"I regret to report a substantial increase (during 1935) in the number of accidents notified, amounting to an excess of 9 per cent. over those for 1934 and as much as 32 per cent. over those for 1933, the corresponding figures for fatalities being 7 and 22 per cent."—*H.M. Chief Inspector of Factories.*

Apart from the industrial import of this somewhat gloomy statement, and its probable explanation by the economist on the grounds of increased industrial activity and the reabsorption of workers who had suffered long periods of inactivity, it presents a fact of very considerable significance to the medical profession in relation to the present-day methods of treatment of industrial injuries.

Treatment of work injuries is carried out both in the factory itself, and outside the factory, in the homes of the workers, and in hospitals throughout the country. Inside the factory such treatment may vary from the fortuitous first aid of the man at the next bench to the skilled assistance of the works nurse or the industrial surgeon; the facilities for treatment range from the primitive minimum required by law to medical arrangements on a par with those of the casualty department of any teaching hospital in the country. It may be of interest therefore to discuss briefly certain practical aspects of treatment, mainly within the factory, which have arisen during the operation of a medical service in an industrial group of some 10,000 operatives.

Incidence of Works Injuries

It is the rule of management that all cases of injury occurring in the course of work are to be reported as soon as possible to the worker's foreman, and further that the injured employee must report immediately to the appropriate ambulance room. The advantages of immediate treatment of even the slightest injury are pointed out, but there is no compulsion regarding the actual treatment; the employee is at all times perfectly free to obtain outside treatment if he so wishes.

The actual number of dressings or attendances during the year 1935 is noted in the Table. These

Attendances for Treatment of Work Injuries during 1935

—	Average number of employees during year.	First—	Subsequent—	Total of—
		Dressings or attendances.		
Males ..	7,316	37,369	51,490	88,859
Females ..	2,684	6,504	7,236	13,740
Total ..	10,000	43,873	58,726	102,599

figures are merely a record of those who attended, at the various ambulance rooms situated in the different factories that house this group of operatives, for treatment of injuries occurring at work, exclusive of staff or foremen. They are no index, for example, of the accident severity or frequency-rates, of accident distribution, of risk entailed, or of efficiency of treatment. They are however some measure of the fact that the workman appreciates to the full the advantages offered, and an indication of the extent of treatment carried out by a progressive industrial organisation in this country.

During the year 1935 there were 504 reportable accidents in the group, but no fatality. A reportable accident is one which necessitates a minimum absence of three days, the report being made to the Inspector of Factories. From these reports, compulsory in every factory and workshop under present-day legislation, the figures quoted in the Annual Report of the Chief Inspector of Factories are compiled.[1]

From the point of view of this group a lost-time accident is one that entails absence from work for at least one complete day. Fig. 1 shows the incidence of lost-time cases in relation to the population at

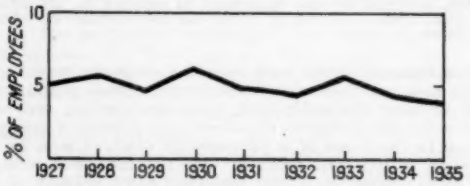


FIG. 1.—Lost-time accident cases (1927–35).

risk in this industrial group during the past nine years. This chart represents the incidence of cases losing time in a population grouped together by reason of trade—i.e., the non-ferrous metal industry—and for no other reason. The sociological conditions of Birmingham and Swansea, Leeds and Liverpool, for these districts show something of the geographical distribution of the factories concerned, provide a variable of considerable importance in the assessment of the significance of figures such as these. They may be taken as one index of the extent of works injuries in what can be termed a heavy industry.

Preventive Measures

The question of accident prevention is to-day giving industry more food for thought than it can properly digest. In the heavier industries in particular the problem is one which causes definite anxiety. How far the industrial medical officer can advise or have jurisdiction in preventive work is a matter of opinion and circumstance. As has already been pointed out, the greater part must of necessity be carried out by management and not be shelved as the complete responsibility of any medical service. As a profession we cannot fail to be interested in the problem, and to coöperate to the best of our ability as and when required.

An analysis of "injury types" over a period of several years showed that some 25 per cent. of all lost time injuries occurring in a metal factory (6500 employees) were due to foot injuries, caused by falling objects such as billets or coils of metal, or truck wheels bruising and breaking toes; such injuries however only accounted for 2 per cent. of the total number of recorded injuries during the

* A paper read (in part) at the fourth meeting of the Association of Industrial Medical Officers.

[1] During 1935 the total number of reported accidents in Great Britain was 149,696, including 843 fatalities.

year. A "safety boot," with a strong reinforced steel-lined toecap, was introduced to the workpeople, and it was not long before an appreciable reduction in the incidence of such injuries was noted (Fig. 2). The following case is of interest.

Due to carelessness a metal billet weighing approximately 360 lb. fell from a height of 1½ feet on to the foot of a labourer aged 30 years. In the normal course of events

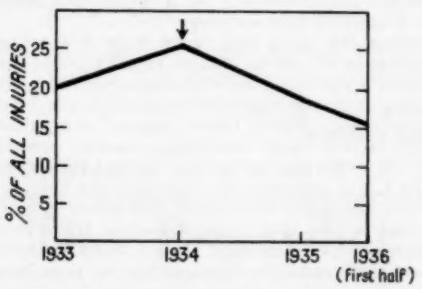


FIG. 2.—Foot injuries (lost-time) in relation to all injuries (lost-time). The arrow marks the introduction of "safety boots."

this accident would have caused a complete crushing of the toes and foot with a resultant surgical amputation at or near the ankle-joint, long absenteeism, and considerable compensation payments, not to speak of unhappiness in the home of a permanently disabled man in the prime of life. In point of fact the man was wearing "safety boots," and only sustained slight bruising of the dorsal aspect of the toes; he was off work three days, and showed no sign of any permanent disability whatsoever. In addition he and his mates were taught a lesson that should not be forgotten as long as they live, and the sale of safety boots in that particular shop went up!

Many other cases, although perhaps not so dramatic, could be quoted to show the significance of this safety measure in relation to foot injuries. One of the practical difficulties has been to persuade the men to buy the boots; this has been partially overcome by educative measures and propaganda in the works. It is hoped that the universal wearing of safety boots by those on "risk" processes will greatly diminish if not altogether eliminate absenteeism due to this cause.

The results of research work on "accident-proneness," to take another aspect of the question, are anxiously awaited by industry to-day. As a result of observations and slowly accumulating data, I am more than satisfied that certain individuals are more liable to accidents than others under equal conditions of exposure and risk. More data and further work are necessary on this question; industry is becoming definitely interested, and in the near future will, I feel certain, take an active part in preventive measures.

Again there is much that can be done by the medical officer in industry to educate supervisory staff regarding the human factor in accident prevention. It is a matter of concern often to find the abysmal ignorance of otherwise comparatively sane and intelligent managers and foremen regarding the all-important relationship between the accidents and factors such as physique, fatigue, overtime, sickness incidence, bad lighting, inadequate ventilation, poor incentives, low rates of pay, or faulty supervision.

Finally there comes the problem of the new entrant to industry, and in particular the juvenile. In many ways there is nothing more tragic than the child of 14 or 15 years of age who becomes permanently disabled at work. During 1935, 20·4 per cent. of all reported non-fatal accidents in this country occurred in "young persons," that is, in employees under the age of 18 years.[1] It is difficult to see moreover how the employer cannot but bear the greater part of responsibility for such injuries. Much can be done, and, one is glad to say, is being done, by the industrialist of to-day in providing facilities for education of juveniles and those who are just commencing their factory career in problems such as accident prevention.

The incidence of lost-time injuries (one day or more) in relation to age has been determined in a group of 10,332 workers, and may be seen in Fig. 3. Fig. 4 shows the relationship between factory experience, in terms of length of service, and injuries, in the same group. From these data it may be seen that in this particular group of operatives (*a*) those between the ages of 14 and 25 together account for some 40 per cent. of all lost-time accidents, and (*b*) that the new entrant to industry, apart from age, is also losing time from injury to a greater degree than the more experienced employee.

The Major Injury and Prevention of Shock

From the medical viewpoint it is often difficult to define accurately the meaning of the term "major" or "serious" injury. However there are certain cases where there is a potential danger to life or limb, and where there is a risk of serious permanent disability and future diminution of wage-earning power. By experience one gets to know such cases, and in like manner there are certain points in treatment which have proved to be of fundamental significance.

Of these perhaps the most important factor is the preventive treatment of *shock*. From the practical point of view it is a fact that the majority of those

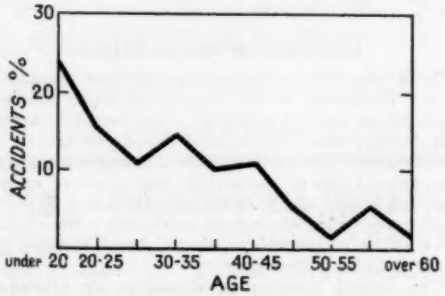


FIG. 3.—Accidents in relation to age in a group of 10,332 workers (January, 1935, to June, 1936).

who sustain serious injuries at work suffer from secondary traumatic shock, which comes on as a rule in from 15–30 minutes after the initial injury.

The routine measures in treatment are naturally familiar to all: warmth, morphia, gum-saline injections, and so on. But one particular point must be emphasised above all others—that is, to get the patient into a warm place before the shock comes on, within 15 minutes, with the minimum of discomfort, and to *keep him there under treatment until any signs of shock have passed off*. In my experience there are almost no exceptions to this rule, provided the patient is breathing satisfactorily, and hæmorrhage has been controlled.

I well remember how the importance of this was brought home to me during my early days in industry.

[1] Ann. Rep., Chief Inspector of Factories for 1935.

I frequently had the feeling that I should send patients to hospital as soon as possible, instead of doing the very reverse. Experience in many dozens of cases has now definitely shown me how wrong this impression was. It was a point, quite frankly, that had not been emphasised or stressed in any satisfactory way during my undergraduate training and hospital experience. And on subsequent inquiry I

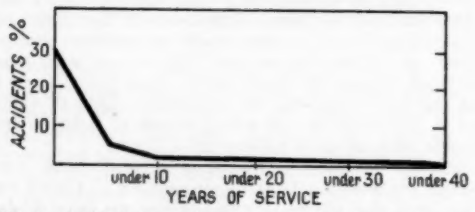


FIG. 4.—Accidents in relation to years of service in a group of 10,332 employees (January, 1935, to June, 1936).

feel satisfied that along these lines modern surgical teaching leaves much to be desired.

How often, even to-day, does the injured man arrive at hospital in a state of profound shock and collapse, "rushed" there in the ambulance; and requiring treatment for an hour or more before the surgeon dare take the risk of operating? How often too does one read in the daily paper that the patient "died from shock," "died in the ambulance," or "was admitted to hospital suffering from severe shock"? One is convinced that if the patient had been adequately treated at the time of the injury, shock would have been either prevented or lessened in intensity, giving the patient an opportunity to recover his biochemical equilibrium before being "rushed" to the nearest hospital. Further, it is my serious contention that shock can be largely prevented, even in the most serious injuries, by the additional therapeutic measure, which appears almost ridiculously simple and childish, of not moving the man for hours on end. Those of us working in the field and seeing many such cases in the course of our work cannot emphasise the importance of the treatment of shock too strongly, not only to students of medicine, to industrial practitioners, but also, with due deference, to the great bulk of casualty surgeons in this country.

Sepsis and Injuries at Work

The relationship between sepsis and industrial injuries is a matter about which very few figures or facts have been published, or for that matter accurately recorded. From personal experience of a number of industrial concerns with no organised medical service, I have no doubt that the incidence of sepsis in wounds caused at work is greater than is generally recognised. Indeed in one works, now under medical control, the manager told me that several years ago it was taken as a matter of course for "septic" cases to occur daily and be one of the commonest causes of injury absenteeism. "Sepsis" in that community was held to be a normal clinical entity such as the term "fracture" or "bruise," and as such called for no comment whatsoever.

Fig. 5 relates to figures taken from the medical records of a large non-ferrous metal factory of approximately 6500 employees. For statistical purposes no sepsis cases have been noted except those who lost time—i.e., one full day or more. While the definition of "sepsis" from the medical point of view potentially includes cases that do not lose time, from the point of view of industry those who lose time are obviously of most significance.

As will be seen from this chart a 0·2 per cent. rate (12 cases) was recorded for 1935. Analysis of these 12 cases is interesting. One patient received no treatment at all in the factory and put off going to his own doctor for some days; in ten cases either a delay occurred between the time of injury and the time of reporting to the works medical department for treatment, or else the person concerned failed on some subsequent occasion to attend for treatment when requested to do so; and in one case only did sepsis occur and cause lost time where the patient immediately reported and was treated throughout. These figures are of more than ordinary significance and afford proof of the satisfactory results that can so easily be obtained with adequate medical control of injuries within the factory.

It is suggested that the following measures have been responsible for the control of sepsis in this group:—

(*a*) The withdrawal of the statutory ambulance boxes from different sites in the factory.

(*b*) The immediate reporting of even trivial injuries by employees.

(*c*) The fact that all dressings are carried out by trained nurses wherever possible.

(*d*) The unification of control of treatment, and standardisation of methods.

(*e*) Careful follow up and supervision of all treatments.

(*f*) The provision of day and night facilities for dressing.

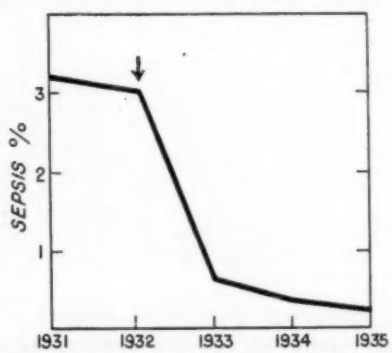


FIG. 5.—The curve shows the percentage of total employees losing time through sepsis in a metal factory with 6500 employees (1931–35). The arrow marks the introduction of medical service.

Treatment of "Minor" Injuries

Treatment of minor injuries on any large scale necessitates definite rules and regulations, which in essence must be brief and as simple as possible. Each medical school has its own idea and customs regarding casualty treatment; we all have our favourite antiseptics and methods of dressing minor injuries. And why not, when there are so many different yet efficient methods in use? The rule however which has been of real help in the organisation of medical service for large groups of workers is to use well-tried methods, standardise them in all dressing stations, and let the "proof of the pudding be in the eating" thereof. In other words, let the sepsis rate and the duration of absenteeism be the index of successful treatment.

The following points are noted merely as a record of my personal experience in relation to the treatment

of minor injuries; not because they are necessarily better than many others but because they have been well and truly tried over a period of four odd years, during which time upwards of half a million dressings and redressings have been done in the same group of workers and by the same medical staff:—

Non-irritating antiseptics such as flavine, rather than iodine.

The use of antiseptic powder on clean wounds after 48 hours, to accelerate healing.

Tin cross-piece finger splints so that a man with a cut finger can continue at work and yet rest his finger.

Cleansing of greasy wounds with trichlorethylene by means of an Enot spray preparatory to application of antiseptic and dressing.

Effective bandaging methods—so that a man can work hard for hours on end without further dressing.

The complete abolition of all "hot fomentations" and the substitution of "cold" therapy—e.g., Lassar's paste, mag. sulph. paste, &c.

Careful follow-up of all cases.

Day and night facilities for dressings in the works.

One further important point must be mentioned. Dispensation was readily granted by the Home Office to withdraw the statutory ambulance boxes from the works, after they had satisfied themselves about the standard of the proposed alternative, which was for all dressings to be done in properly appointed ambulance rooms by trained nurses and assistants. I feel that this measure has been of the greatest help in the almost complete eradication of sepsis due to injuries; and furthermore the supervisory medical officer can be assured that treatment is uniform throughout the group and on a par with accepted modern methods.

Industrial casualty surgery is aimed all the time at keeping the man at work, or getting him back to work at the earliest opportunity compatible with safety to himself and others. For this reason it is a science by itself—differing in fundamental detail from the hospital casualty department where the man's occupation cannot possibly be fully understood, and where too the long queue of patients necessitates a wait of several hours, lost time, lost money, and consequent dissatisfaction both to the man and to his employer.

Treatment Outside the Factory

No discussion of the treatment of industrial injuries can be complete without mention of the essential part that is played by the medical practitioner external to industry, in the patient's home and in hospital. To industry itself this part of treatment is a matter of vital importance. It is not the place here to recapitulate the arguments on the subject of rehabilitation of the injured worker. Suffice it to say that there appears to be more than sufficient evidence of its inadequacy for the present-day requirements of industry and the individual worker. Recent evidence regarding the rehabilitation period of fractures, for example, is of absorbing interest to industry, and should be of more than passing interest to the medical profession. As a result the suggestion has been made that industry itself should have fracture clinics and its own hospitals.

The future treatment of industrial injuries lies ultimately in the hands of the medical profession itself, but many factors can undoubtedly influence its development. From time to time the working man is frankly dubious about the value of the present-day hospital system. In Birmingham alone he contributed some £225,890 during 1935 to the hospital contributory scheme; he wants to know, and will soon demand to know, if he is getting an adequate return for his outlay. The employers of industry too are now beginning to realise the sheer economic value not only of medical service within the factory but also of effective external measures that are taken to enable the injured man to return to work at the earliest possible opportunity.

What then is to be done? The remedy surely lies in the hands of the medical profession. Is it not the moral obligation of hospital staffs and private practitioners to make themselves conversant with the industrial aspect of each injury that they meet? And having recognised the economic value of their part in treatment to use every means in their power towards successful rehabilitation?

Industry is eagerly awaiting a lead from the medical profession. It is dependent all the time on us for help and advice, for in the end we have to do the actual treatment. Surely then we must put our backs into the job, by teaching our students and practitioners, by improving our technique, and most of all by whole-hearted coöperation with the worker and employer. In the history of rehabilitation measures the best results have been obtained where there is intelligent and unselfish coöperation between the various doctors who may be links in the chain of operative treatment, the worker himself, and industry as a whole.

Summary and Conclusions

1. Figures are given to show the incidence of work injuries in an industrial group of 10,000 employees. By virtue of the fact that all actual treatment is voluntary there is evidence at the least that industrial medical service is fully appreciated by the workpeople.

2. Certain measures to prevent lost time due to injury are noted. The introduction of "safety boots" into the heavy industries, for instance, has shown promising results in the prevention of foot injuries.

3. The preventive treatment of traumatic shock is discussed. It is contended that the ill-effects of shock can be greatly diminished and often eliminated by keeping the patient in the factory ambulance room for periods of time up to four or five hours before sending to hospital.

4. From figures submitted it has been shown that following the introduction of an organised medical service the incidence of sepsis can be reduced to a minimum.

5. Measures that have been effective in the treatment of a consecutive series of 500,000 cases of minor injury are enumerated.

6. A plea is put forward for greater coöperation between the medical officer in the works, the practitioner in the home, and the specialist in the hospital; and that collaboration of these three with the worker and with industry itself is the only certain means of effecting satisfactory rehabilitation of the injured workman.

PRESTON ROYAL INFIRMARY.—Lord Derby opened a new maternity hospital at Preston Royal Infirmary on Sept. 4th. It will accommodate 43 beds and there will be special facilities for antenatal treatment in which the Lancashire county council and the Preston corporation will coöperate with the infirmary authorities. The sum of £38,000 has been raised towards the total cost of £43,000.

CHRONIC RHEUMATISM

A COMPARATIVE STUDY OF THE SIGNIFICANCE OF INFECTION IN INDIVIDUAL GROUPS

BY J. W. T. PATTERSON, M.D., F.R.C.P. Edin.
HON. PHYSICIAN TO THE ROYAL BRINE BATHS CLINIC, DROITWICH SPA; AND

H. B. SALT, M.Sc., A.I.C.
IN CHARGE OF THE CLINICAL LABORATORY AT THE SPA

FOUR clinical groups were studied and the allocation of cases into one or other of these groups was made by clinical diagnosis and quite independently of laboratory findings. In order to prevent any confusion of terms, the clinical divisions are defined at the outset as follows.

1. *Primary Rheumatoid Arthritis.*—That type seen chiefly in women during the childbearing period. Vasomotor disturbances are common, such as paræsthesias and local sweatings (particularly of the extremities), tremors, fatigue, and instability of pulse-rate. Weakness, cramps, and wasting of muscles are common, and many of these symptoms appear or are in evidence before any joint change manifests itself. The joint changes commence in the small joints of the hands as typical fusiform swellings, the amount of the swelling being made more obvious by the associated muscular wasting which may be extreme. The progress is one of increasing joint involvement, usually centripetal and showing bilateral symmetry. Later contractures, particularly ulnar deviation and ankylosis, are prominent. There is an associated general disturbance suggestive of an active infective process, with secondary anæmia, tachycardia, sweating, and loss of weight and appetite.

The number of cases studied in this group is necessarily small, since in spa practice it is unusual to get cases sufficiently early to make diagnosis certain. These patients usually arrive at spas late in the course of the disease and manifesting the end-results of a process no longer active. In this study, only the cases falling definitely into the above category have been included.

2. *Secondary Rheumatoid Arthritis.*—That type of arthritis seen at any age but more usually from 40 to 50—i.e., a little later than primary rheumatoid arthritis, and affecting men and women in about equal numbers. Many joints are involved early, and the mid-joints of the fingers are not always primarily affected. Wrists, elbows, and knees are common sites. The joints are swollen, "doughy," and tender on pressure. Associated muscle wasting is marked, and movement painful and restricted. Distortion of joints occurs but ulnar deviation is less constant than in primary rheumatoid arthritis. Prodromal symptoms are less in evidence than in the primary form, and the general symptoms of malaise are later in appearing.

3. *Fibrositis and Panniculitis.*—That type of chronic rheumatism affecting chiefly the muscular or subcutaneous tissues in which nodular thickenings or large indurated subcutaneous areas with painful and tender spots manifest themselves. These cases are extremely tender to pressure, and are perhaps commonest among women about or after the menopause.

4. *Osteo-arthritis.*—That type of arthritis commonest in the later decades and affecting both sexes with perhaps a heavier incidence among the males. Prodromal symptoms are usually absent and progress is slow. The condition is seen chiefly in large joints, particularly the hip, and radiographically is chiefly monarticular. General symptoms are frequently absent, the patient feeling particularly fit "except for the hip." Most of the sufferers are overweight and well nourished, and muscular wasting is marked usually in the later stages only.

SEDIMENTATION-RATE IN THE FOUR GROUPS

The first study consisted of the investigation of the sedimentation-rate readings in 180 cases of chronic rheumatism. These determinations were made by the Westergren technique using oxalated blood and recording the fall in millimetres after one hour. Table I. shows an analysis of these results which on the whole fell into groups corresponding to the different types of chronic rheumatism studied.

TABLE I

Sedimentation-rate Values (S.R.) in 180 Cases of Chronic Rheumatic Disease

S.R. group. Fall in mm. in one hour.	Rheumatoid arthritis.		Fibrositis and panniculitis.	Osteo-arthritis.
	Primary.	Secondary		
0–10	0	6	49	14
11–30	2	18	19	5
31–50	4	18	8	2
51–70	5	9	1	..
71–90	8	2	..	..
91–110	1	6	..	..
111–130	1	2	..	..
Total cases ..	21	61	77	21
Total S.R. range..	18–115	1–116	1–60	1–50
Average S.R. ..	65	42	13	12

The highest readings were obtained in the primary rheumatoid arthritis group, the next highest in the secondary rheumatoid arthritis group, while the fibrositic and osteo-arthritic groups gave a majority of normal readings (0–10 mm. in one hour being considered normal). A statistical analysis of Table I. showed significant differences between primary arthritis and secondary arthritis and fibrositis, but not between fibrositis and osteo-arthritis.

These results are in general agreement with those of Aldred-Brown and Munro, Dawson and Boots, Forestier and Gerbay, and Race.

BACTERIOLOGICAL FINDINGS IN THE FOUR GROUPS

In view of this apparently definite demarcation of clinical groups, it was felt that a study of the bacteriological findings in association with sedimentation-rate readings would show some similar individuality of grouping. Accordingly, 130 cases were studied in which, in addition to the sedimentation-rate readings, the following individual investigations were carried out in each case.

Bacteriological cultures of: (*a*) postnasal swab (direct route); (*b*) throat or tonsil swab; (*c*) urine, by catheter or interrupted flow; and (*d*) fæces.

In all cases, primary cultures were made on 7 per cent. normal horse blood agar in order to differentiate beta-hæmolytic organisms. The alpha-hæmolytic streptococci (Brown) were included in the group "*viridans* streptococci."

These various foci were investigated as a routine procedure and irrespective of the presence or absence of local symptoms. In a large majority of cases no focal symptoms were complained of at all.

The bacteriological findings for 15 cases of primary rheumatoid arthritis, 50 cases of secondary rheumatoid arthritis, 50 cases of fibrositis, and 15 cases of osteoarthritis are summarised in Table II. The figures represent the percentage incidence of the

TABLE II

SHOWING THE PERCENTAGE INCIDENCE OF ORGANISMS ISOLATED FROM 130 CASES OF CHRONIC RHEUMATIC DISEASE

Organism found.	Postnasal.				Tonsil.				Urine.				Fæces.			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
Pneumococci	0	2	4	0	47	38	42	47	..	..	..	..	..	..	..	..
Staph. aureus	20	20	6	20	13	16	4	0	..	..	..	..	..	..	..	..
Staph. albus	87	78	84	80	20	12	13	20	0	0	2	0	0	2	0	7
Hæm. strep.	0	2	0	7	20	20	15	20	0	2	4	0	7	6	4	7
Virid. strep.	0	6	4	0	94	92	92	87	0	12	28	13	0	8	6	7
Non-hæm. strep.	0	0	0	0	7	2	10	13	7	8	6	0	40	46	38	60
Proteus	..	..	..	..	..	..	..	..	0	4	4	7	0	4	0	7
Hæm. *B. coli*	..	..	..	..	..	..	..	..	0	0	0	0	13	12	11	0
B. coli	..	..	..	..	..	..	..	..	13	14	15	20	100	100	100	100
B. friedländeri	0	2	0	0	0	2	0	0	..	..	..	..	..	..	..	..
H. influenzæ	0	2	0	0	0	0	0	0	..	..	..	..	..	..	..	..
Diphtheroids	40	28	30	34	0	4	6	7	..	..	..	..	..	..	..	..
M. catarrhalis group	7	4	4	13	94	92	90	74	..	..	..	..	..	..	..	..

(A) = Primary and (B) = secondary rheumatoid arthritis. (C) = Fibrositis and panniculitis. (D) = Osteoarthritis.

organisms found in each site investigated, for each of the four clinical groups.

The first impression from a general survey of this Table is that of a remarkable similarity of the distribution of organisms in the different clinical groups. No clinical group appears to have any real individual bacteriology, and indeed the relationship of high sedimentation-rate readings with a more significant bacteriology is not found.

The theory of infection has been emphasised by numerous observers who have stressed the ætiological relationship of various organisms in the different clinical groups. Thus, in rheumatoid arthritis, *Streptococcus hæmolyticus* (Cecil et al.) and *Streptococcus viridans* (Clawson et al.) are held responsible. Again, streptococci are considered by Willcox to be responsible for fibrositis. Finally, although osteoarthritis is not regarded as an infectious disease by the majority, streptococci are again incriminated by Clawson et al. and by Crowe.

In view of this significance attributed to certain organisms, it is interesting to note that the various members of the streptococcal family are more or less evenly distributed in each clinical group. Indeed, that entity which *clinically* would appear to be most typical of an infective process (i.e., the primary rheumatoid arthritis group) actually shows the least widespread distribution of streptococci.

Table II. was also subjected to statistical analysis, and the value of chi squared for the various groups was worked out. In every case the values showed differences which were too small to be of significance. Hence, the general impression of a similarity of the distribution of organisms in the different clinical groups is hereby proved.

It was felt that more significant results might be obtained from a consideration of the distribution of the more definitely pathogenic strains, irrespective of the individual bacterial species. Table III. shows the percentage of cases showing infection with pathogenic organisms of any class in the various situations. The finding of *Staphylococcus aureus*, hæmolytic streptococci, Friedländer's bacillus, and the influenza bacillus was always considered to be significant; also the finding of *viridans* streptococci and pneumococci in situations other than the throat. Non-hæmolytic streptococci from postnasal swabs and urine, also in considerable numbers from the fæces, were regarded as pathogenic. Other organisms that were considered pathogenic were *B. proteus* and *B. coli* isolated from urine, and *B. proteus* and hæmolytic *B. coli* isolated from fæces. The urinary infections were considered significant only when associated with the presence of pus cells in the centrifuged deposit.

TABLE III

Showing the Percentage Frequency of Isolation of Pathogenic Organisms

Site.	Rheumatoid arthritis.		Fibrositis and panniculitis.	Osteoarthritis.
	Primary.	Secondary.		
Postnasal	20	26	10	16
Tonsil	33	32	18	20
Urine	12	32	44	33
Fæces	40	40	26	33
Any situation	60	76	66	60

The only feature evident from Table III. is a possibly high pathogenicity found in secondary rheumatoid arthritis. The figures did not lend themselves readily to statistical analysis, but bearing in mind the results previously recorded, it would appear that there are no significant differences between the figures for the various groups.

SUMMARY

1. Sedimentation-rate values are presented for 180 cases of chronic rheumatism, divided clinically into primary rheumatoid arthritis, secondary rheumatoid arthritis, fibrositis and panniculitis, and osteoarthritis.

2. Bacteriological findings from postnasal, tonsil, urine, and fæces specimens are recorded for 130 cases of chronic rheumatism divided into the same four groups.

3. While the sedimentation-rate values were found to be characteristic for each clinical division of chronic rheumatism, no individual bacteriological findings were obtained.

We desire to record our thanks to Prof. C. C. Okell, of University College Hospital, for much helpful criticism and for kindly arranging the statistical analyses of the results.

REFERENCES

Aldred-Brown, G. R. P., and Munro, J. M. H.: Quart. Jour. Med., 1935, xxvii., 269.
Cecil, Nichols, and Stainsby: Arch. Internal Med., 1929, xliii., 571.
Clawson, Wetherby, Hilbert, and Hilleboe: Amer. Jour. Med. Sci., 1932, clxxxiv., 758.
Crowe, H. W.: Brit. Med. Jour., 1932, i., 861.
Dawson, M. H., and Boots, R. H.: New England Jour. Med., 1933, ccviii., 1030.
Forestier, J., and Gerbay, F.: L'Etude de la Sedimentation des Globules Rouges, chez les Rheumatisants chroniques. Rapport presenté a la Société Médicale d'Aix-les-Bains, May 17th, 1931.
Race, J.: Proc. Roy. Soc. Med. (Sect. Balneol. and Climatol.), 1929, p. 611.
Willcox, Sir W.: Jour. State Med., 1932, xl., 197.

AN EXPERIMENT IN X RAY PELVIMETRY*

By C. Nicholson, M.C., M.D. Glasg.

Although pelvimetry by radiograms has been practised with some degree of accuracy for more than 30 years it makes but slow progress towards acceptance as a diagnostic method of precision. Two things are apparently lacking in order that the method should come into general use. The first is a technique which, while accurate, is within the ability of the general practitioner using that type of X ray outfit which is commonly available in cottage hospitals. The second is a set of measurements whereby primiparæ may be classified early in pregnancy, according to their pelvic capacity, into those who can with safety be left to the nurse-midwife, those who may need delivery with low forceps, and those who must have hospital treatment, with the services of a consulting obstetrician if necessary.

THE GEOMETRIC THEORY

The technique I am about to describe is a stereometric method using a horizontal shift of the tube; but the points are recognised and the measurements are made by a process depending on the mathematics of stereometry. It requires the correlation of the two films in the same position relative to each other as when they were taken; it also requires that each film should have marked on it the projection of the tube—i.e., the foot of the perpendicular ray—in the position which it occupied when the exposure was made. When these two conditions are satisfied the following three propositions are mathematically true.

1. The line joining the two shadows (SS′) of the same point is parallel to the line joining the projections (PP′) of the tube (TT′)—i.e., to the line of the stereometric shift.

2. If each of the two shadows is joined to the projection of the position of the tube which produced it, then these lines intersect in the projection on the film of the point (A) which caused the shadows.

3. The height (AN) above the film of the object causing the shadows is equal to the focus-film distance (TP) multiplied by the distance between the shadows and divided by the distance between the shadows plus the amount of the stereometric shift.

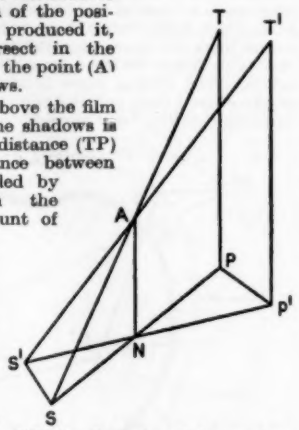


FIG. 1.—Geometry of stereometry.

The geometric proof of these three propositions is not difficult, and their meaning may be appreciated by referring to Fig. 1, where:—

1. SS′ is parallel to PP′.

2. SP and S′P′ meet in N, and AN is perpendicular to the plane SS′PP′.

3. $$AN = TP \times \frac{SS'}{SS' + PP'}$$

By means of this simple geometry it is possible to make a rectilinear projection of any object on the film, and from that projection to measure with extreme accuracy any diameter of that object.

* Part of a thesis submitted for the Sir Charles Hastings prize, 1936, and specially commended.

Technique

THE POSITION OF THE PELVIS

When we come to the practical application of this theory to pelvimetry the first requirement is to secure films which will show all those diameters that are of importance in obstetrics. Now all radiologists are agreed that the diameters of the brim are best demonstrated with the brim parallel with the film. It is not, however, necessary with this technique for the brim to be accurately parallel with the film, and it seems better to aim at rapid and automatic adjustment of the patient on the couch.

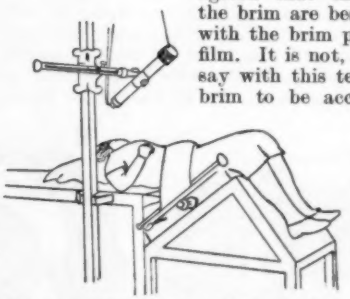


FIG. 2.—Position of the patient with the brim parallel to the film.

I use the recumbent position of the patient, with film and tube tilted to the necessary angle. I had a table made with its upper surface at an angle of 35° to the horizontal; to this surface a ledge is fixed which is just long enough to fit accurately between the feet of a flat type Potter-Bucky diaphragm, so that when the diaphragm is placed on the table its position is automatically fixed. The table is then bolted rigidly to the foot of the wooden type couch, and when this is done the centre of the diaphragm is just above the level of the couch top. A shelf is bolted to the foot of the couch to prolong its surface and bridge the gap between couch and diaphragm. Now when the patient lies on the couch with the buttocks against the diaphragm and the thighs slightly flexed and resting on its top half, the brim of the pelvis is roughly parallel to the film and is centrally placed over it. The position is shown in Fig. 2, which is a tracing from a photograph.

FIG. 3.—Position of the patient with the outlet parallel to the film.

The outlet of the pelvis is of very great importance in obstetrics, and a further position is necessary to demonstrate that level.

A position at right angles to the last—i.e., with the brim of the pelvis perpendicular to the film—shows all diameters of the outlet very well. This position is easily reached from the last; the patient is asked first to abduct the thighs as far as possible, and then to sit up and lean forward so that the thighs are completely flexed on the abdomen. This position is shown in Fig. 3. It should be noted that the rays passing through the sacrum have very little tissue to penetrate, and it is necessary to use a lead screen for part of the exposure on the principle of that used by L. A. Rowden with the symphysis pubis; it may the form of the truncated triangle shown in Fig. 4.

These two views of the pelvis also give two views of the fœtal head, and it is generally possible to measure both the biparietal and occipito-bregmatic diameters. It will be seen too that both positions are easily secured and maintained, and are not uncomfortable.

THE TUBE AND OTHER DETAILS

The tube is adjusted so that, when the cross arm is in the central position of the stereometric shift, the normal ray strikes the central point of the diaphragm. A socket to take the pillar of the tube-stand, bolted to the side of the couch, and marks on the pillar, the cross arm, and the stub of the tube-stand make it easy to repeat this centring at will. A mathematical examination of the error produced in the calculation of a diameter by faulty centring of the tube shows that this error can seldom be appreciable, and can never be serious. The focus-

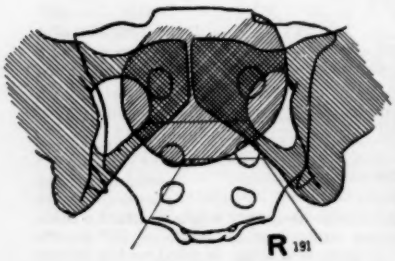


FIG. 4.—Film of the outlet.

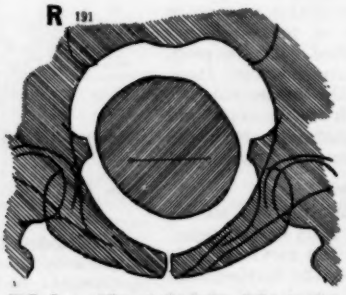


FIG. 5A.—Film of the brim, tube to the right.

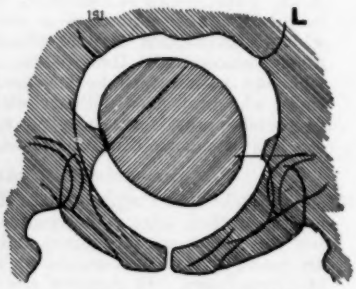


FIG. 5B.—Tube to the left.

film distance used is 80 cm.; the stereometric shift used is 10 cm., the usual 6 cm. not being accurate enough. The kilovoltage used is about 85, the milliamperage 25, and the exposures vary from 4 to 10 or even 15 secs.

MARKING THE PROJECTIONS OF THE TUBE ON THE FILM

The size of the film used is 12 × 10 in. for all exposures, and the two cassettes are labelled with the letters R. and L. to indicate in which direction the tube has been displaced. The technique for marking the projection of the focus on the film is simple. Very short lengths of lead wire are inserted into the wooden surface of the Potter-Bucky diaphragm at its centre point, and about 12 cm. from the centre in the central horizontal line of the diaphragm. These cause shadows on the film and the line joining them is the line of the stereometric shift. The surface of the diaphragm is 38 mm. above the surface of the film, and the shadows of the lead markers are displaced when the tube is moved; the shadow of the centre marker is displaced 2·5 mm. to either side of the centre in the stereometric films. It is thus easy to mark the projections of the focus on the films by drawing a line through the three shadows of the lead, and marking a point on this line 52·5 mm. in the appropriate direction from the centre shadow.

WORK ON THE FILMS

To correlate the two skiagrams in their initial relative position, two films can be taken and a tracing made of one on transparent paper, which can then be superimposed on the other. This method can be used on very poor films, and with ordinary care there need be very little loss of accuracy.

The work on the films can be followed by referring to Figs. 4, 5 (A and B), 6 (A and B), and 7.

The stereometric shift and the projection of the focus having been marked on each film, a piece of tracing paper is taken and a line drawn across it; on this line points are marked 10 cm. apart. One of the films is placed on the viewing box and the tracing paper superimposed so that the line and the appropriate points coincide. The necessary outline is now traced, and the points are marked from which measurements are to be made; through these points lines are drawn parallel to the stereometric shift; this can readily be done by setting up the line to a T-square. The tracing paper is now similarly superimposed on the second film, and the points where the parallel lines cross the outline are marked. Each marked point is

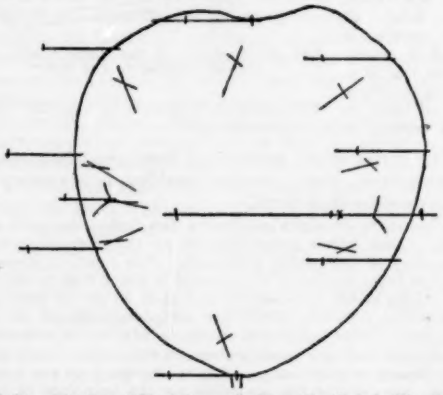


FIG. 6A.—Tracing of the brim made from the films in Fig. 5 and ready for measurement.

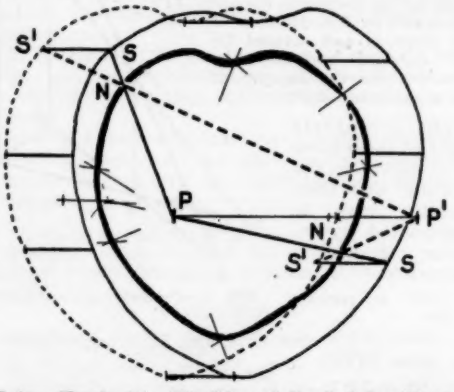


FIG. 6B.—Key to (A). The thin and the dotted outlines are tracings of the brim in Figs. 5 A and 5 B respectively, obtained according to the method described in the text, the tube having its projection of focus at P and P′ respectively. The lettering corresponds to that in Fig. 1, S, S′ being the shadows of points on the brim—in this case those needed for measuring the right oblique diameter. N is the intersection of lines joining S P and S′ P′—i.e., the projection of the points on the brim. The heavy outline is that obtained by joining all the intersections and represents the projection of the brim. In practice only the tracing in (A) is made.

now joined to the appropriate projection of the focus, and the intersection of these lines gives the projection of the object to which they relate.

It must not infrequently happen that a pair of points is so nearly in line with the stereometric shift that this intersection of the lines becomes too indefinite for accuracy. Referring however to Fig. 1, it can be seen that each line joining a point to the projection of a focus is divided at the intersection in parts which are proportional to the shadow shift and the stereometric shift, that

$$\frac{SN}{NP} = \frac{SS'}{PP'}.$$

Such a projection may then be determined by a simple calculation.

We now have a true projection of the different diameters on the tracing paper, and these may be measured with dividers and scale. If the terminal points of a diameter are at an equal height above the film the length of the projection is the length of the diameter itself. When, however, the terminals are at different heights a correction must be applied. A difference in height is easily recognised by a difference in the amount of shadow shift, and each shadow shift must be accurately measured; from these measurements the height of the objects may be calculated by means of the formula in Proposition 3 but are given in Table I. The true diameter may be obtained from the formula:—

$$D = \sqrt{P^2 + (H-h)^2}$$

where D is the true diameter, P is its projection on the film, and H and h are the different heights (from Table I.). If this calculation had to be made in every case it would be a tedious process, but a reference to Table II. shows that the result can be obtained at a glance.

THE DIAMETERS AT THE BRIM

In the films of the brim of the pelvis the diameters which may be measured are the conjugate, the transverse, the two diagonals, and the distance between the ischial spines.

The conjugate.—The anterior terminals of this diameter are easily determined with accuracy, and it should be noted that what is measured is the obstetrical and not the anatomical conjugate. The two shadows of the promontory of the sacrum are not so easy to determine accurately, for here the outline of the bone lies parallel to the line of stereometric shift, and it is often necessary to gauge the amount of the shadow shift from some other point in the outline, such as the sacro-iliac synchondrosis, which is known to be at or near the same level as the promontory. It is found that the angle of 35° used on the table to allow for the inclination of the brim to the horizontal is quite accurate enough, and it is very seldom necessary to employ the Tables for difference in level between the symphysis pubis and the promontory of the sacrum; it should be noted that no correction is to be applied unless the difference in level of these two points is more than 10 mm., and this corresponds to an inclination of more than 5° on either side of the 35° chosen.

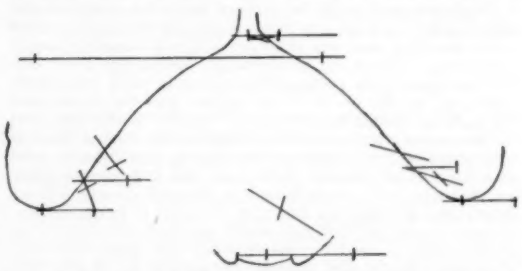


FIG. 7.—Tracing of the outlet made from the film in Fig. 4 and ready for measurement.

The *transverse diameter* is taken as the widest diameter at right angles to the conjugate; there seems to be no necessity to do more than estimate this by sight.

The diagonals.—The sacro-iliac synchondroses are easily determined, but the ilio-pectineal eminences do not project from the shadow of the ilio-pectineal line, and the anterior terminal of a diagonal is taken at the point where the shadow of the acetabulum comes nearest to the outline of the brim.

The ischial spines are usually prominent features in the films, but they may be obscured by the shadow of the fœtal head, or may not show up well in the poorer films of late pregnancy.

TABLE I.—*Height of an Object above the Film*

Shadow shift	..	..	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Height (mm.)	..	..	45	52	59	66	72	79	85	91	97	103	109	115	121	127	132	138	143	148	154	159
Shadow shift	..	..	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Height (mm.)	..	..	164	169	174	178	183	188	192	197	201	206	211	216	220	224	229	233	237	241	244	248

TABLE II.—*Correction for Difference in Height*

Projection of diameter (mm.).	Difference in height exceeds (mm.).																			
70	8	15	19	22	25	28	31	33	35	38	40	42	44	46	47	49	51	53	54	56
75	9	15	20	23	26	29	32	34	37	39	41	43	45	47	49	51	52	54	56	57
80	9	16	20	24	27	30	33	35	38	40	42	44	46	48	50	52	54	56	57	59
85	9	16	21	25	28	31	34	36	39	41	43	46	48	50	52	54	55	57	59	61
90	10	17	21	25	28	32	35	38	40	42	45	47	49	51	53	55	57	59	61	62
95	10	17	22	26	30	33	36	38	41	44	46	48	50	52	54	56	58	60	62	64
100	10	17	23	27	30	34	37	39	42	45	47	49	52	54	56	58	60	62	64	65
105	10	18	23	27	31	34	38	40	43	46	48	50	53	55	57	59	61	63	65	67
110	11	18	24	28	32	35	38	41	44	47	49	52	54	56	58	60	62	64	66	68
115	11	19	24	29	32	36	39	42	45	48	50	53	55	57	60	62	64	66	68	70
120	11	19	25	29	33	37	40	43	46	48	51	54	56	59	61	63	65	67	69	71
125	11	19	25	30	33	37	41	44	47	50	52	55	57	60	62	64	66	68	70	72
130	11	20	26	30	35	38	42	45	48	51	53	56	58	61	63	65	68	70	72	74
135	12	20	26	31	35	39	42	46	49	51	53	57	59	62	64	67	69	71	73	75
140	12	21	27	32	35	40	43	46	50	52	55	58	60	63	65	68	70	72	74	76
145	12	21	27	32	36	40	44	47	50	53	56	59	61	64	66	69	71	73	76	78
150	12	21	28	33	37	41	45	48	51	54	57	60	63	65	68	70	72	75	77	79
Add to projection (mm.) ..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

THE DIAMETERS AT THE OUTLET

The view of the pelvis which is used for the outlet is an unusual one; Figs. 4 and 7 are taken from a film of the same patient as Figs. 5 and 6. From this view it is possible to measure the subpubic angle, the transverse diameter, and a pubo-sacral diameter.

Subpubic angle.—It is obvious that the whole of the flat medial part of the pubic bones lie roughly parallel with the film, and the subpubic angle is therefore easily measured. The point of the angle lies at the lower end of the symphysis pubis; this point is very frequently obscured by the body of the sacrum and the fœtal head to such an extent that it cannot be seen in the film, but it is not very inaccurate to continue the visible lines of the edges of the inferior rami to meet, and then to take the amount of shadow shift from the last visible place on that edge. The lines including the angle lie along these edges, but as they are not straight lines it is convenient to take points on their shadows 8 cm. from the symphysis. The technique used for determining this angle has been thus carefully detailed because it seems to be of considerable value in obstetrics and a different technique might give rather different readings. It is useful to note that, as the pubes are so nearly parallel to the film, this angle may be read off directly from a single film.

The *transverse diameter* is taken from the posterior edges of the ischial tuberosities. This gives a greater value than the anatomical transverse, but, as the medial surfaces of the ischia cannot be clearly seen in most of the films, it seemed better to use a measurement that is consistently accurate.

The *pubo-sacral diameter* is measured from the postero-inferior end of the symphysis pubis to the anterior surface of the sacrum at the level of the sacro-coccygeal articulation. The second point is not hard to determine as the outline of the bone is clear, and the level may be estimated from the shadows of the cornua which are always prominent in the films, and the amount of shadow shift they make can be accurately measured. As this diameter makes an angle of more than 45° with the plane of the film the Tables must invariably be used to get the result; the accuracy of the readings is thereby no doubt somewhat impaired.

Results

This technique has been in use for over two years in a cottage hospital which has a maternity ward of six beds. It is the rule to carry out the measurements at some date near the end of the sixth month of pregnancy; this date is early enough to give time for reference to the consulting obstetrician if thought necessary, and late enough to permit diagnosing a presentation that can be expected to be maintained until term. In this way a series of measurements at the brim in 215 cases has been built up; measurement of the outlet was begun later, in 139 of the 215 cases.

TABLE III

Measurements of the "Average" Pelvis

—	Anatomical* (mm.).	Stereometrical (mm.).
Brim—		
Conjugate diameter	110	116
Transverse ,, ...	135	133
Diagonal ,, ...	125	124
Outlet—		
Between ischial spines	110	107
,, ,, tuberosities† ..	115	127
Pubo-sacral diameter†	115	130
Subpubic angle	About 90°	86°

* Gray's Anatomy, 25th ed., London.

† The basis for the anatomical and stereometrical measurements does not correspond.

THE "AVERAGE" PELVIS

Although there may be no normal pelvis, there is an average pelvis described by the anatomist. It is interesting to note that the averages of the measurements obtained by X ray pelvimetry agree very well with these anatomical figures, and it might be well to go through the diameters in detail (Table III.). There is a considerable discrepancy in the conjugate diameter which led to remeasuring a large part of the series, but the result remained unaltered. A possible explanation is that the anatomical figure is taken from the cadaver, and probably the aged cadaver, and it seems not unlikely that this diameter should become less in old age. It is very variable, the greatest being 142 mm. and the least 87 mm.

The pelvic index is the percentage ratio of the conjugate to the transverse diameter at the brim; it is used by Sir W. Turner to classify the pelvis anthropologically. The average for the series is 86, and 121 of the cases are platypellic, 60 are mesatipellic, and 34 are dolichopellic; this agrees with the anthropological findings for European women. It is of practical interest in pelvimetry by X rays to note that the inclination of the pelvis to the horizontal varies fairly closely with the pelvic index; the flat pelvis may have a tilt of more than 60°, and the narrow pelvis a tilt of less than 50°.

TABLE IV.A

Flat Pelvis (Pelvic Index less than 70)

Serial No.	Conj. (mm.).	Trans. (mm.).	Diag. I. (mm.).	Diag. II. (mm.).	Subpubic angle (deg.).	Pelvic index.	Labour.	Weight of child.
								lb. oz.
19	92	136	124	132	..	64	(3) Previous labours normal.	..
							(4) Normal.	6 8
21	93	136	126	127	..	64	(1) ,,	8 5
							(2) ,,	8 6
							(3) ,,	7 10
56	87	140	125	125	..	68	(3) Previous labours normal.	..
							(4) Normal.	8 0
70	87	128	117	121	95	68	(1) Surgical induction.	5 14
							(2) ,, ,,	5 9
91	91	141	125	125	..	65	Forceps on account of phthisis.	6 9
99	100	144	126	125	91	69	(1) Normal.	7 0
							(2) ,,	6 9
130	96	129	122	126	99	69	Normal.	6 4
139	85	147	126	127	99	58	Normal: premature.	5 7

TABLE IV.B

Narrow Pelvis (Pelvic Index greater than 100)

1	132	128	129	112	..	103	Normal.	6
25	132	124	119	114	93	106	(1) ,,	8 0
							(2) ,,	7 8
							(3) ,,	7 15
38	135	133	127	120	..	102	(1) ,,	6 4
							(2) ,,	6 12
98	142	136	133	133	90	104	Occipito-posterior; version; forceps.	7 9
110	129	114	110	114	73	113	Cæsarean section (Table IV.D).	6 10
136	141	136	130	129	79	104	Early ruptures of membranes; forceps.	6 2
138	124	122	113	117	92	101	Pott's disease; deformed pelvis; surgical induction; forceps.	6 7
142	125	118	114	111	72	106	Normal (Table IV.D).	6 12
162	130	129	124	125	89	101	Normal.	6 14
195	136	135	129	126	82	101	,,	5 5
209	124	116	114	116	95	107	Breech.	6 13
214	142	137	127	124	78	104	Twin pregnancy.	{3 5 / 6 12}

THE ABNORMAL PELVIS

The series includes a proportion of pelves which are sufficiently far from the average as to be called abnormal. These are collected and set out in Tables

IV.A, B, C, and D, the results of labour being shown in each case. It cannot be too strongly emphasised that no surgical induction or Cæsarean section was performed without the patient being first referred to the consulting obstetrician, and that a decision in favour of operation was not arrived at in any case by reason of the measurements alone without examination of the patient herself and careful consideration of all the factors. It is no doubt probable that, as more experience in the interpretation of the data is being gained, so more reliance is being placed on the figures than in the early days of the experiment, but they have been, and are being, used solely for the purpose of deciding when it is necessary to refer the patient to the consultant.

TABLE IV.C

Generally Contracted Pelvis (Average of the four diameters at brim less than 115 mm.)

Serial No.	Conj. (mm.).	Trans. (mm.).	Diag. I. (mm.).	Diag. II. (mm.).	Subpubic angle (deg.).	Average diam. (mm.).	Labour.	Weight of child.
								lb. oz.
10	99	114	108	102	..	106	Cæsarean section.	6 3
48	106	122	111	112	..	113	(1) Normal.	6 9
							(2) ,,	6 7
65	108	124	111	115	84	114	(1) Postmature; Cæsarean section.	7 7
							(2) Surgical induction.	5 7
69	110	122	112	114	..	114	Normal.	6 1
140	112	112	102	107	86	109	,,	6 6
161	101	124	113	111	86	112	Forceps; severe moulding.	8 0
168	99	126	114	116	73	114	Surgical induction; forceps (Table IV.D).	6 0
179	108	122	107	111	77	112	High forceps; severe moulding.	7 6
184	109	122	119	109	85	114	,,	6 10
187	108	123	112	113	94	113	Cæsarean section.	7 8
193	112	119	112	114	82	114	Normal.	5 5
207	102	123	117	116	72	114	Surgical induction; forceps (Table IV.D).	6 8
213	98	127	116	118	83	115	(1) to (5) Normal. (6) Forceps; weights unknown.	
							(7) Very difficult forceps; stillbirth.	10 9

TABLE IV.D

Contracted Outlet (Subpubic Angle less than 75°)

Serial No.	Conj. (mm.).	Trans. (mm.).	Diag. I. (mm.).	Diag. II. (mm.).	Subpubic angle (deg.).	Labour.	Weight of child.
							lb. oz.
3	126	137	127	122	71	(1) Failed forceps; Cæsarean section.	6 11
						(2) Cæsarean section.	6 9
78	118	131	119	120	73	(1) Very difficult forceps; stillbirth.	1
						(2) Surgical induction; cord twice round neck; stillbirth.	4 5
104	120	131	120	119	74	Pre-eclampsia; premature birth.	4 2
110	129	114	110	114	73	Cæsarean section (Table IV.B).	6 10
124	111	131	120	122	74	Normal.	7 4
126	116	123	113	114	73	,,	6 6
128	122	137	122	129	72	,,	6 3
142	125	118	114	111	72	Normal (Table IV.B).	6 12
146	117	137	125	125	74	Normal.	8 5
150	112	155	131	136	71	Persistent occipito-posterior; version; forceps.	7 2
156	117	134	120	121	73	Occipito-posterior; brow presentation; forceps.	6 10
168	99	126	114	116	73	Surgical induction; forceps (Table IV.C).	6 0
194	128	132	120	121	74	Occipito-posterior; forceps.	6 2
207	102	123	117	116	72	Surgical induction; forceps (Table IV.C).	6 8
208	112	132	123	116	73	(1) Craniotomy. (2) Cæsarean section.	5 14

In the Tables the figures in parentheses refer to the numbe of pregnancies; cases without figures are primiparæ.

Conclusion

The criteria that have been suggested for contraction at both brim and outlet appear to be reasonable, and must include all cases where difficulty due to dystocia is liable to occur. If that is accepted it surely follows that patients showing that amount of contraction require hospital treatment with the services of a consulting obstetrician; from the figures this would involve more than 10 per cent. of all primiparæ. There is no doubt that this is a very high proportion, but it is almost certain that with further experience the criteria of contraction may be scaled down and the proportion correspondingly reduced. The results already achieved in this district fully justify what may be regarded by some as an excess of caution.

I wish to acknowledge the great help I have received from the staff of Moreton-in-Marsh District Hospital, particularly Mr. H. Sandeman Allen, honorary consulting gynæcologist, Drs. J. E. Jameson and L. R. King, honorary surgeons, and Miss Ockenden, matron.

TREATMENT OF RECURRENT NASAL POLYPI WITH RADIUM

BY W. G. SCOTT-BROWN, M.D. Camb., F.R.C.S. Eng.

ASSISTANT SURGEON TO THE THROAT, NOSE, AND EAR DEPARTMENT, ROYAL FREE HOSPITAL, LONDON; AND TO THE CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL

THE cases published in this paper are to demonstrate the successful treatment of certain types of nasal polypi, which have up to the present accounted for a large number of unsuccessful results. Their treatment in the past has been followed by recurrence, which was often rapid, in spite of complete removal, but which can now be prevented by the application of radium to the ethmoid capsule.

Nasal polypi may be divided into three groups: (*a*) infective; (*b*) allergic; (*c*) allergic with secondary infection.

INFECTIVE TYPE

Much might be written on the infective cases, since their treatment involves attention to any underlying infection in the sinuses, but in general it is necessary to remove the polypi intranasally and exenterate the ethmoid. Other infected sinuses are treated at the time. A more radical procedure may be necessary, and an external operation gives a more direct access to the ethmoid, frontal, and sphenoid cells, when these sinuses can be completely dealt with under direct vision. The polypi do not recur in this type if the sepsis is cured.

ALLERGIC TYPE

It is with the allergic cases that this communication is primarily concerned. They differ clinically from the infective cases mainly in their tendency to recur even in the absence of, or after the cure of, infection.

History.—The patient complains of obstruction and catarrh as in the infective case, but on careful questioning the following factors may be brought out:

1. A family history of allergic manifestations—e.g., asthma, hay-fever, and urticaria.
2. Previous allergic manifestations—e.g., infantile eczema, or perhaps "croupy" attacks at night, and later urticaria, hay-fever, or asthma.
3. Present symptoms of an "allergic nose."

Nearly all patients with an allergic mucous membrane of the nose will give a history of sneezing on waking or on first rising. It may be started by stepping out on to a cold floor or by a draught. This sneezing is usually accompanied by a clear watery nasal discharge, and is followed by some nasal obstruction. Often these attacks are more severe and more frequent, being accompanied by profuse watery discharge which makes the upper lip sore. It is usually followed by a temporary nasal obstruction, and there is often irritation of the eyes. The patient may know certain things which precipitate the attacks—e.g., shaking out dusty blankets or books, or going near stables.

Signs.—To appreciate the variety of signs found in the allergic nose it is necessary to consider for a moment the changes that occur.

Clinical pathology.—In the early stages of allergic attacks of this kind, the swelling of the nasal mucous membrane is a venous engorgement. The turbinates are bluish, red, and swollen, but subside again to normal. After several attacks the mucous membrane is left hypertrophied, œdematous, pale, and bluish from many congestions with incomplete recovery. This typical pale swollen appearance of the mucous membrane of the allergic nose is associated with a boggy feeling on probing. The boggy turbinates have a mottled surface, and the mottling is the result of hypertrophy of the mucous membrane, submucous connective tissue, and vessels. These hypertrophies may become œdematous and œdematous hypertrophies are polypi.

The mucous membrane of the middle turbinate and middle meatus is the usual site of this polypoid change. There may be one or two small polypi which when removed leave a clear nose except for the general pallor and bogginess. X ray examination reveals a general haziness of all sinuses due to thickening of the lining mucosa, but this appearance is found in most allergic conditions and even in asthmatics where nasal infection is excluded.

There may be no sign of infection clinically or radiologically, and these cases are purely allergic in origin. They are the cases which recur time after time in spite of complete removal. An examination of the watery discharge from these cases often reveals an excess of eosinophils. Skin tests will sometimes give a clue to the specific allergen that is producing the sensitivity and the characteristics of an allergic nose.

ALLERGIC POLYPI WITH SECONDARY INFECTION

Obstruction is the most potent non-specific factor in the body giving rise to infection, and this is equally true of the gall-bladder, kidney, or a nasal sinus. Polypi occur in a nose in which there is no infection but in a patient with an allergic history or manifestations, and infection frequently occurs in the sinuses secondarily to the obstruction of the polypi.

These cases fall into the same category as the pure allergic cases, and the treatment only varies in that infection must be dealt with at the time of removal of the polypi, and its presence must be excluded before radium is inserted. The outlook is not quite so certain as in the non-infective cases, presumably because it is difficult to be sure that infection is eradicated. If any still persists, the radium does not produce good results and may even aggravate the condition of the nasal mucous membrane and sinuses. This is in line with the general effect of radium in the presence of infection.

TREATMENT OF ALLERGIC POLYPI

In the allergic cases polypi may be removed dozens of times, even a hundred, and still recur, and they may never be infected. Every out-patient department contains many such cases, though in a great many secondary infection will eventually be found.

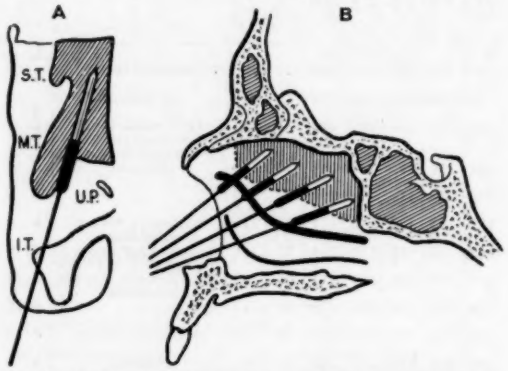


FIG. 1.—(A) The ethmoid capsule from the front: S.T. = superior turbinate; M.T. = middle turbinate; I.T. = inferior turbinate; U.P. = uncinate process; (B) with needles in position.

The first step is to discover the specific allergen if possible. This is done by performing skin tests for a number of common proteins. The results of the skin tests must be carefully considered in advising the avoidance of certain foods, contact with feathers, fur, animals, or face powder—to mention a few of the common allergens. In certain cases it may be necessary to desensitise by injection, as with dust or, say, horse hair, when a patient's livelihood depends on his association with horses. When this has been done a number of allergic cases will be found to recover. The mucous membrane becomes normal in appearance, and a simple nasal toilet with a snare will clear up the polypi and they may not recur. Some cases are not cured and continue to grow polypi.

TECHNIQUE OF RADIUM APPLICATION

The technique was suggested to me by E. Berven in 1930, though he did not differentiate between the various types of polypi. The polypi are completely removed intranasally and the ethmoid opened if necessary. Infection is excluded clinically, radiologically, and at operation. Three weeks later four radium needles are applied to each ethmoid capsule. The needles are 3·5 cm. long, each with 10 mg. of radium concentrated at the centre. The external diameter is 1·6 mm. and there is 0·5 mm. platinum filtration.

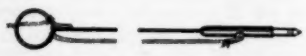


FIG. 2.—The radium needle.

Under local anæsthesia they are pushed into the ethmoid capsule under the middle turbinate (Fig. 1 A). The first into the posterior ethmoid so that its point

rests against the anterior sphenoidal wall. The next two at spaced intervals in front of them, and the fourth into the anterior ethmoid in the region of the anterior ethmoid ostium between the mid-turbinate and bulla (Fig. 1 B). These needles are applied on the handle illustrated (Fig. 2), are left in situ for six hours, and then applied to the other side. Four more needles are now available and therefore both ethmoids are irradiated simultaneously.

RESULTS

The results are dramatic, and in considering them it should be borne in mind that most of the cases were chronic out-patients who had been attending at one hospital or another for many years. In the first instance no definite selection of cases was made, and infective cases were not recognised as being unsuitable, though very dirty cases were instinctively avoided. The majority turned out to be allergic when investigated from this point of view.

In all, 13 cases have been treated with radium over one year ago and only cases of a year or more have been considered with the exception of Case 7 which will be discussed separately. Of these, 11 cases have had no further polypi since radium treatment, 9 having been treated over 20 months ago. One case in the series (Case 14) was a failure. There was no evidence of allergy and there was undoubtedly a pansinusitis. Radium was applied early in the series but without efficient treatment of the infection. One further case (Case 12), which had radium implanted over two years ago, has recently had two very small polypi removed. Polypi had been removed many times before the radium over a period of four years, but these small polypi appeared quite isolated, and the rest of the mucous membrane looked pink and firm. Of the 11 remaining cases, 4 are now of two years' standing and all have been free from polypi and obstruction from the time of the radium implantation up to the present. Most of them had had polypi removed many times before, and one, every 3 or 4 months for 25 years. In this and several other cases polypi had been removed frequently, and in exactly the same manner as when radium was implanted.

In all these cases there was a history in varying degree of allergic symptoms—i.e., spasms of sneezing, followed by obstruction, or asthma. In all, the polypi and obstruction have been cured, and in one or two the allergic symptoms have been cured or relieved. In two the attacks of sneezing and profuse watery discharge have not been affected, but these attacks are no longer followed by obstruction.

The absence of polypi or polypoid mucous membrane was always confirmed by taking a small piece of mucous membrane from the middle turbinate or bulla, choosing it from any doubtful looking area. If the mucous membrane looked pale or swollen at any point a piece was taken from there. In only one case was there histological evidence of a small piece of polypoid mucous membrane, though clinically this did not appear to be so. The report on the section states that it is "not a normal polypus, being not œdematous and a more consolidated portion of connective tissue." The changes seen in all cases were those compatible with exposure of mucous membrane to radium. There was perivascular fibrosis, more marked round the larger vessels, and there was submucous fibrosis in some cases. The histological changes were difficult to classify, and more work is required on this aspect of the treatment. Histological evidence, moreover, failed to confirm that all these cases were allergic, again chiefly because the histology of the condition is not fully worked out. One therefore has to depend on the history and clinical evidence that these cases were either pure allergic or allergic with secondary infection.

Case 7 requires a special note, since it presents points of interest, though it was the only one in the series treated for such a short time—eight months. Polypi were removed and recurred quickly. After X ray examination polypi were again removed with a submucous resection, antrostomy, and ethmoidectomy. Within a month polypi were again recurring. They were removed and radium applied to one side only. Within six months the nose was again full of polypi on the non-irradiated side, while the irradiated side was free from polypi.

Two patients, Cases 10 and 11, who have had no polypi since the application of radium 13 and 20 months ago respectively have or may require further operation for infection.

In Case 11 there was considerable infection before the radium application and the left antrum and right frontal were opaque radiologically. When the polypi were removed, the ethmoids were opened up and the left antrum drained intranasally, but the frontal was left to drain after ethmoidectomy and removal of polypi. Though no polypi re-formed, an external frontal operation has since been done by the Ferris Smith technique with skin graft of the frontonasal duct. In the other patient, Case 10, who has had no polypi since the radium application, the right antrum, which had been drained intranasally, has not cleared up and a radical operation may be necessary.

Five other cases show some atrophic rhinitis, three severe and two mild. This is due to many, frequent and often inexpert removals of polypi with loss of turbinal mucous membrane. It does not appear to be due to the radium, as cases in which the mucous membrane of the nose and particularly the turbinals was intact have not developed atrophic rhinitis either clinically or histologically.

CASE 1. Polypi for 13 years with records of 13 removals; radium 23 months ago; no polypi since.—Hay-fever for years. Sneezing and watery discharge from nose before obstruction started. Polypi first removed in 1923 and 13 times entered in out-patient notes since. X ray report: left maxillary sinus obscured, otherwise normal. June, 1933: intranasal antrostomy and removal of polypi still; secondary infection. The polypi still recurred four times in two years. July, 1934: 40 mg. of radium for six hours each side=240 mg.-hours each side. September, 1935: left side, nose clear and normal; right side, small pale fibrous area under anterior end middle turbinate; piece for section shows no polypi but normal mucous membrane with changes expected from radium application. December, 1935, skin reactions: sensitive to lamb, feathers, orris root. April, 1936: no polypi or pus, little sneezing, 21 months after radium; slight crusting; mild atrophic rhinitis due to removal of turbinates and mucous membrane on many occasions.

CASE 2. Polypi removed 100 times since 1911; radium 21 months ago; no polypi since.—Asthma often. In-patient 1932 and 1933 with asthma. Slight attacks twice a week for years. April, 1934: polypi removed as an in-patient. Radiography of sinuses: nothing abnormal discovered except general slight thickening of the mucous membrane. Pathological report: mucous membrane shows chronic inflammatory changes; infiltration with numerous eosinophils and plasma cells. September, 1934: radium 40 mg. six hours=240 mg.-hours each side. September, 1935: no polypi; mucous membrane appears normal and section shows only changes compatible with the radium applications; asthma rarely and now slight—i.e., one attack in three months. April, 1936: no polypi either side; mild sneezing attacks; no asthma.

CASE 3. Polypi removed 100 times in past 15 years; radium 26 months ago; no polypi since.—Polypi grow again as soon as removed; troublesome sneezing attacks always. Radiography, 1934: sinuses normal. 1931–33: antral washouts clear. March 26th, 1934: polypi removed. April 17th: 12 mg. in four needles for 24 hours each side = 288 mg.-hours each side. June, 1935, skin reactions: sensitive to pollen and dust. No polypi. April, 1936: two years later no sign of polypi since; nose clear and normal except for slight crusting; atrophic rhinitis

due to removal of turbinates. Radiography: sinuses clear; still some spasmodic rhinorrhœa. Now receiving injections to desensitise for pollen and dust.

CASE 4. Polypi removed on many occasions in past eight years; radium 26 months ago; no polypi since.—February, 1934: submucous resection, left intranasal antrostomy; intranasal ethmoids and polypi. April, 1934: 12 mg. for 20 hours each side in four needles=240 mg.-hours in each side. April 21st, 1936: better in general health for past two years; no polypi, no obstruction since radium; nasal mucous membrane congested with acute rhinitis but no polypi. Radiography: thickened lining membrane of the antra, more marked on the right; right antral puncture clear. May 21st, 1936: nose clear and no symptoms.

CASE 5. Polypi removed twice in two years; radium 28 months ago; no polypi since.—Sneezing, rhinorrhœa, and obstruction for two years. July, 1933: submucous resection, and anterior end of middle turbinate right and polypi both sides removed. February, 1934: polypi removed but rhinorrhœa still; four needles with 12 mg. six hours in both sides=72 mg.-hours each side. September, 1935: no polypi; section of mucous membrane shows no hypertrophies or polypi but changes compatible with radium application present. Skin reactions: sensitive to horse, chicken, cat, dog, wheat, lamb, egg, and oats.

CASE 6. Polypi removed many times in past 14 years; radium 13 months ago; no polypi since.—Hay-fever always; sneezing and rhinorrhœa. March, 1935: polypi removed from both middle meatus and ethmoid cells opened; polypi recurred rapidly. May, 1935: polypi again removed and radium inserted, 40 mg. for six hours in both sides=240 mg.-hours on each side. September, 1935: no polypi; mucous membrane looks normal; section of mucous membrane shows small polypus from inferior meatus but not œdematous, and a more consolidated portion of connective tissue than usual; mucous membrane from middle meatus is normal. May, 1936: doctor reports nose clear; no sneezing, rhinorrhœa, or obstruction since radium; no polypi to be seen; patient fitter than for many years.

CASE 7. Polypi removed, but recurred; radium applied one side only eight months ago; no polypi since in that side; other side many polypi re-formed.—History of nasal obstruction for some months and nasal catarrh. April, 1935: polypi removed. June, 1935: recurrence but radiography shows antra and ethmoids obscured; submucous resection; bilateral antrostomy and ethmoids drained. July, 1935: polypi again recurring; again removed and recommended for radium. October, 1935: radium applied, 40 mg. for six hours=240 mg.-hours in left side; some night nausea, vomiting, headaches, and left-sided abdominal pain; therefore right side not treated but patient told to return in two to three weeks; not seen again for six months. April 16th, 1936: left clear, no polypi; right side of nose full of polypi again. May 3rd, 1936: radium to right side after removal of polypi.

CASE 8. Polypi removed many times in past six years; radium 20 months ago; no polypi since.—For 21 years attacks of sneezing and profuse rhinorrhœa. August, 1934: polypi removed; recurred and removed again in October; radium in left side, four needles with 12 mg. for 24 hours=288 mg.-hours. September, 1935: attacks of sneezing and rhinorrhœa much improved since radium; no polypi, no obstruction; mucous membrane looks pale and normal, so firmly adherent and thin that it was difficult to take a piece for section without bone; section shows mucous membrane with radium changes but otherwise normal.

CASE 9. Polypi removed twice in past three years; radium 15 months ago; no polypi since.—Sneezing attacks for two years with rhinorrhœa. 1933: polypi removed. December, 1934: bilateral antrostomy and polypi again. March 26th, 1935: radium to right ethmoid, 40 mg. for six hours=240 mg.-hours. April 2nd, 1935: radium to left ethmoid, 40 mg. for six hours=240 mg.-hours. September, 1935: right side normal; left side, small œdematous areas on left middle turbinate removed for section; section shows one minute œdematous polypi and two fragments of normal mucous membrane. April, 1936: nose appears quite normal both sides; no polypi or polypoid mucous membrane; no infection.

CASE 10. Polypi removed twice in past two years; radium 13 months ago. No polypi since.—Chronic nasal obstruction and headache for one year. March, 1934: polypi removed as out-patient. March, 1935: polypi removed as in-patient with right antrostomy. May, 1935: polypi removed left and radium inserted left, 40 mg. for six hours=240 mg.-hours. March, 1936: no polypi; no obstruction since radium; sneezing and rhinorrhœa still present; right antrum not yet clear.

CASE 11. Polypi removed twice in past two years; much infection; radium 20 months ago; no polypi since.—Obstruction, sneezing attacks for seven years; no discharge; frontal headaches. Radiography: left antrum obscured; right frontal obscured. July, 1934: removal of polypi, exenteration of ethmoid and left intranasal antrostomy. Oct. 1st, 1934: polypi, a few on both sides removed; radium right, 40 mg. for six hours=240 mg.-hours. Oct. 29th, 1934: radium left, 40 mg. for six hours. November, 1935: no polypi but complains of nasal obstruction, pus right middle meatus. Radiography: right frontal still obscured; external frontal sinus operation with skin graft by Ferris Smith technique. April, 1936: crusting right side and some discharge; frontal sinus washed out clear and frontonasal duct patent; no polypi, no headaches; nasal mucous membrane generally atrophic on the right.

CASE 12. Polypi removed many times during the past four years; infection ++; radium 27 months ago.—Colds with obstruction many years; asthma in attacks. May, 1933: double Caldwell-Luc operation and intranasal ethmoids. Feb. 13th, 1934: polypi again removed. March 20th, 1934: right, 12 mg. radium inserted 17 hours =204 mg.-hours. July 3rd, 1934: left, 12 mg. 24 hours=288 mg.-hours. September, 1935: no polypi since radium; ethmoids not clear from infection and improved by ephedrine displacement; section of mucous membrane shows radium changes but no polypi. March, 1936: two small polypi removed right side. April: no polypi; mucous membrane atrophic. Skin reactions: no significant change in sensitivity reactions.

CASE 13. Polypi removed many times in past ten years; infection ++; radium 20 months ago; no polypi since.—Nasal discharge 20 years; sneezing attacks. August, 1934: radiography shows right antrum, frontal and ethmoids obscured; polypi removed, right intranasal ethmoid and right antrostomy. Oct. 15th, 1934: radium right, 40 mg. for nine hours=360 mg.-hours. Nov. 29th: two small polypi far back on right middle turbinate. March, 1935: no polypi, little crusting; no sneezing. March, 1936: sneezing attacks for past two months; no polypi but œdematous mucous membrane in middle meatus.

CASE 14. Polypi removed frequently during the past 15 years; infection ++; radium 17 months ago; not improved.—Jan. 28th, 1935: deflected septum to the right; radium to right ethmoid, 40 mg. for six hours=240 mg.-hours. Feb. 4th, 1935: radium to left ethmoid, 40 mg. for six hours=240 mg.-hours. September, 1935: left side clear; right, many polypi. February, 1936: submucous resection; removal of polypi right. Skin reactions: no allergic factor found.

SUMMARY

Nasal polypi are classified into:—

(*a*) Allergic: (1) non-infected; (2) secondarily infected. (*b*) Primarily infective.

Allergic polypi which have a great tendency to frequent recurrence may be prevented by application of radium.

In support of this practice 12 cases are discussed, all irradiated over a year ago.

My thanks are due to Dr. E. Berven, of Radiumhemmet, Stockholm, for interesting me in this subject and for his help; also to Dr. Joan Ross for the histological examinations, and to Dr. G. W. Bray for his interest in cases referred to him for investigation.

COARCTATION OF THE AORTA WITH TOXIC GOITRE

TREATED BY COMPLETE THYROIDECTOMY

By HAROLD COOKSON, M.D., B.Sc. Birm., M.R.C.P. Lond.

PHYSICIAN TO THE CORNELIA AND EAST DORSET HOSPITAL, POOLE

COARCTATION of the aorta, a stenotic condition of the aortic arch, is one of the less common forms of congenital malformation of the cardiovascular system. It has been reported in some 300 cases but it is probable that the real incidence in adult life is higher than the reports would indicate, even those of post-mortem material. In uncomplicated cases both cyanosis and clubbing of the fingers are absent, and attention is usually drawn to the malady by excessive arterial pulsation in the upper half of the body or by the finding of a high brachial systolic blood pressure in a relatively young subject. The pulse pressure is usually high in the arm, and in this resembles the pressure of many young adults with toxic goitre. This latter condition actually does occur in subjects with coarctation and with a frequency which excludes the possibility of mere coincidence. The patient now to be described had these combined lesions; and in view of recent work on the effect of hypothyroidism on cardiac failure, treatment by total thyroidectomy was carried out with a satisfactory result.

A married woman, aged 38, was referred to me by my colleague, Dr. A. M. Barron, and admitted to the Cornelia Hospital on June 22nd, 1933. Her physical health had been good until 1922, when after the birth of her first child she had "fainting attacks." She was kept in bed for six months and after this remained well till 1930. At this time she again became pregnant and when three months advanced she noticed shortness of breath on exertion. In the later months she complained of precordial pain, both on exertion and at rest. After the labour, which was normal, the symptoms had persisted on and off, but at the time when she came under observation the chief complaints were of palpitation, throbbing in the head, neck, and chest, head noises, giddiness, and coldness of the legs. For chest pain induced by exertion nitroglycerin was tried and found to give relief.

The *family history* included the following: father died at 56 of a stroke; one brother died at 50 of "heart trouble and asthma"; one sister had rheumatic fever and now suffers from "heart trouble and goitre."

On *examination* the facial expression was anxious, the skin flushed, and the eyes had a watery staring appearance, but there was no real exophthalmos. The thyroid gland appeared slightly full, was regular, and not unduly firm. The out-stretched hands showed a coarse tremor; in the neck, arms, and retina, arterial pulsation was very conspicuous. Enlarged subcutaneous arteries over the sternum, in the intercostal spaces anteriorly, in the axillæ, and round the scapulæ could be felt pulsating, and over some of them a systolic murmur was heard; in the abdominal aorta and femoral arteries pulsation was hardly discernible. Blood pressure: right arm, 300/100 mm. Hg, left arm, 240/120; right leg, 150/100 (oscillometer). Apex-beat heaving, outside nipple line, first sound reduplicated at the apex; loud rough systolic murmur at aortic area transmitted into the neck; no signs of congestive failure. Electrocardiogram (Fig. 1 A) showed normal rhythm, rate 110; slight ventricular predominance (main deflection of Q R S positive in lead I., negative in lead III.); Q R S slurred and slightly widened; T_1 negative, T_2 diphasic, T_3 positive. Teleradiogram (Fig. 2) left ventricle enlarged; ascending aorta slightly prominent, arch high, knob absent; slight notching of the lower borders of the ribs.

During two months' observation there was constant slight pyrexia, averaging 99° F. in the evening. At intervals there were attacks during which the patient complained of headache, sensations of flushing, and of heat or cold; when of cold, there was obvious pallor of the skin and the pulse-rate was accelerated to between 120 and 140, and tremor was conspicuous. These symptoms combined to produce a picture resembling that due to a large dose of adrenaline, and similar to what has been described in connexion with paraganglioma of the supra-renal medulla. Absolute rest had little effect upon the symptoms for which she had originally presented herself. An unusual complaint was of pulsation in the right lower axilla, where a large subcutaneous artery could be palpated. After discharge from hospital there was a gradual increase in the severity of the symptoms; she was frequently confined to bed, became more emotional, and wept frequently.

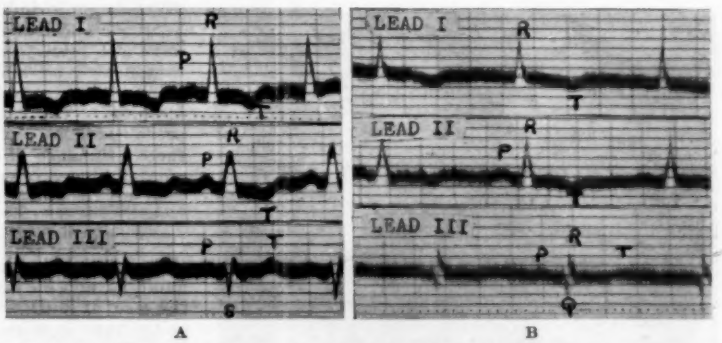


FIG. 1.—Electrocardiograms taken (A) 22 months before and (B) 10 months after operation. The heart rate has fallen from 110 to about 68; other changes shown in the later tracing are diminished amplitude of the waves and alteration in the form of Q R S in lead III.

She was readmitted on Feb. 3rd, 1935; a new symptom at this time resembled scotoma scintillans; flashes of light alternating with blindness, which was said to synchronise with the beating of the heart. The basal metabolism on Feb. 6th was + 24 per cent., falling to + 15 per cent. 12 days later; urine, normal; fasting blood-sugar, 96 mg. On March 23rd Lugol's iodine, ℥ 60 daily, was given for the first time; after 12 days no improvement was noted.

Operation.—On April 4th complete thyroidectomy was performed by my colleague, Mr. N. F. Adeney (anæsthetic: avertin, gas-and-oxygen, and 2 oz. ether). The gland showed slight general enlargement, no definite nodulation; a section of it was reported upon (Dr. W. McNaughtan) as follows: "Microscopic section demonstrates a moderate degree of hyperplasia. The acini vary in size from medium to small and in most the lining epithelium is of a low columnar type, although in some there are small inter-acinal buds of taller columnar cells; the colloid in these acini is rather faintly stained and vacuolated; there are also many small areas of more hyperplastic acini containing no colloid and forming almost solid intra-acinal groups of cells. Vascularity is markedly increased throughout and especially so in the capsule. Fibrous stroma is scanty and there is almost a complete absence of lymphoid tissue in the sections examined."

Progress.—The patient's condition during and immediately after operation was satisfactory, except that on the fourth day she complained of twitching of the face

and a sensation of electric shocks all over the body. The suggestion of tetany was confirmed by a Chvostek's sign, and the symptoms cleared up in a few days on calcium lactate 60 grains daily. Her temperament 3 weeks after operation was decidedly more phlegmatic and the complexion, previously high coloured, was now slightly waxy. The basal metabolic rate 25 days after operation was — 9 per cent., that is 24 per cent. below the last pre-operative estimation. About this time she had severe sensations of terror and the development of mental symptoms lead to certification a few weeks later. During this time, however, she had gained about 10 lb. in weight.

She was discharged from hospital, and was next seen on Feb. 24th, 1936, when her physical and mental condition had so altered that she was hardly recognisable. While previously she had been excitable and talkative, she was now quiet and reserved. She said that she was able to do all her own housework without fatigue; was never troubled with shortness of breath, insomnia, throbbing in the head (except very slightly after scrubbing), palpitation, or giddiness. Popping noises in the head were very slight, and neither flushing nor pallor of the face ever occurred. She also volunteered that she was now constantly warm, whereas formerly she had often felt cold especially in the legs. The sensation of floating

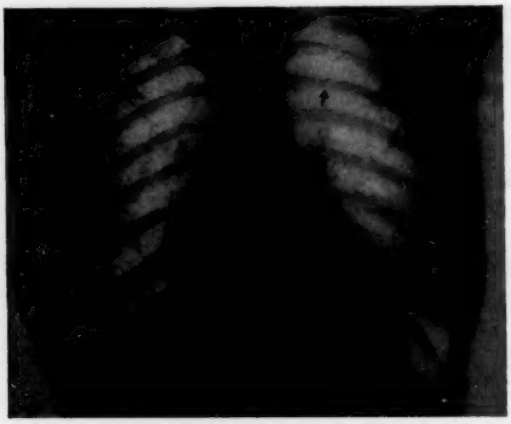


FIG. 2.—Coarctation of the aorta. Teleradiogram showing heart enlarged to the left; ascending aorta prominent; aortic knob absent; notching of the lower borders of the ribs (indicated by arrows).

and the pulsation at the side of the chest had disappeared. On the whole she was cheerful though occasionally might be depressed. The menstrual periods had been regular for the past three months. Physical examination showed a paler complexion, absence of tremor, pulse-rate 72; electrocardiogram (Fig. 1 B) unchanged except for decreased amplitude of all waves, and slight alteration in the form of the Q R S complex in lead III. Teleradiogram showed the transverse cardiac diameter to be unaltered. In the arteries of both legs there was still no pulsation (the common femorals excepted), neither could any be felt in the abdominal aorta. In the arms the blood pressure had fallen to 230/100 in the right arm, and 210/110 in the left. Her weight was 9 st. 5½ lb., only 1½ lb. more than before the operation.

Psychological report.—The acute mental symptoms which developed shortly after total thyroidectomy, and which led to temporary certification, are reported upon by Dr. J. S. Horsley as follows: This unique case of melancholia complicating total thyroidectomy exhibits the interesting feature of an acute psychosis supervening upon a very chronic psychoneurosis. The psychoneurosis began during adolescence with shyness, abnormal fatiguability, feelings of inferiority, and a tendency to meet all difficulties by the hysterical type of over-reaction. Prior to marriage, there was an unhappy love affair which appears to have initiated a series of emotional storms and "fainting attacks." Marriage appears to have aggravated her symptoms, and the complication of frigidity produced a still more marked anxiety reaction. This state continued for 15 years. The acute melancholic psychosis became apparent within a short time of her discharge from hospital after the operation. Her mental condition was one of profound depression, with intolerable feelings of guilt, making life so unbearable that suicide seemed the only means of escape. She attempted to take her life on three occasions. She was pre-occupied with fears that she was suffering from consumption or cancer and she believed this to be a punishment for some sin she had committed many years ago. She was certified and admitted to the Dorset Mental Hospital where her illness ran a course characteristic of melancholia. The duration of the illness was some nine months, with gradual convalescence, ending in an apparently good recovery.

COMMENT

The psychiatric interest of this case is the apparent effect of total thyroidectomy in precipitating a "flight into melancholia." It is well known that thyroid insufficiency tends to produce mental dulling and retardation. The insidious onset of spontaneous myxœdema is indicated in many cases by mental hebetude and loss of memory; mania and depression have also been described. For the more severe cases complicated by affective disturbances and delusions Pilcz has suggested the name of "myxœdematous insanity." The case described, although apparently precipitated by thyroidectomy, improved in spite of the continuance of myxœdema, in which respect the mental illness resembled simple melancholia rather than myxœdematous insanity.

DISCUSSION

Coarctation has been reported in relatively small numbers, and only a proportion of these have passed the age of puberty; in them symptoms of toxic goitre have appeared often enough to make it certain that the occurrence is something more than a mere coincidence. Toxic goitre of the usual and uncomplicated kind occurs predominantly in the female after puberty, and it is in this sex and after this age that thyroid disturbance has usually been found in association with coarctation. Loriga (1887) described two patients with this congenital defect, one of whom, a girl of 18, had fullness of the thyroid. He mentioned toxic goitre ("Flajani's disease") in the differential diagnosis, but evidently did not consider the combination of the two lesions. Since then, however, the associated conditions have been reported many times—e.g., by Blackford (1928), two cases; Ulrich (1931), one original case; Amberg (1932), one case; Eppinger and Midelfart (1933), two cases; and Brown (1934), one case. Grollman and Ferrigan (1934) described the case of a man of 34 with a basal metabolic rate of +15 per cent. and a slight tachycardia, but none of the other usual symptoms of toxic goitre appears to have been present. Blackford quotes Strassmann (1922) as reporting a patient on whom thyroidectomy was performed, but fuller information is not available In Evans's (1933) study of 28 cases of coarctation there was no instance of toxic goitre, but only 9 of these patients lived beyond puberty, and of these only 1 was female. Of the 9 cases mentioned above, 7 were females, and in some an early diagnosis of an uncomplicated toxic goitre was made, the primary congenital lesion being discovered only at a later date.

When coarctation is discovered in an individual without symptoms, as may occasionally happen, there is likely to be excessive pulsation of the cervical

arteries, with a thrill and systolic murmur over them, and a high systolic and pulse pressure in the arms. If thyroid disturbance should be present in addition, these signs are exaggerated, and are accompanied by tachycardia, tremor, nervousness, and perhaps slight fullness of the thyroid gland. Fuller examination would reveal the characteristic signs of coarctation, such as palpable subcutaneous arteries in the chest wall and feeble pulsation in the abdominal aorta and femoral artery; otherwise the limited diagnosis which the more conspicuous signs suggest might be made.

The mechanism by which thyroid disturbance arises in this condition has been thought to be an increased blood-supply to the gland with increase in its function, but without striking increase in its size. As there is partial or complete obstruction to the flow of blood through the descending thoracic aorta, an anastomotic circulation for the supply of the lower part of the body develops, chiefly through the subclavian arteries. As a fortuitous result of this it may be that the inferior thyroid arteries, which arise from the subclavians, carry an increased blood-supply to the gland. Similarly the superior thyroid arteries, coming off the external carotids, will share any increase of flow through the common carotids which is suggested by their excessive pulsation. The patient described had a variety of cerebral symptoms, which may have been a result of an excessive blood-supply to the brain, and the section of the thyroid demonstrated both hyperplasia and a definite increase in vascularity.

The treatment of this patient by medical means proved quite ineffective; for in spite of it she steadily got worse, and some surgical method was considered. Although it has been suggested that ligation of the inferior thyroid arteries might be an effective method of treatment (Ulrich), the failure of this procedure to modify symptoms in the ordinary case of toxic goitre for more than a very short period, because of the development of anastomoses, was an argument against it. Subtotal thyroidectomy was the obvious method for controlling the function of the gland, but on the other hand there was something to recommend a complete thyroidectomy as originated and practised in the Boston Clinics, for intractable heart failure and angina. The earlier work on this method was published some three years ago (Blumgart, Levine, and Berlin; Blumgart, Riseman, Davis, and Berlin; and Levine, Cutler, and Eppinger), and since then many detailed studies have been published by Blumgart and his co-workers. Briefly, the sum of their experience suggests that the type of patient most likely to benefit from the removal of the whole of the normal thyroid is one in which congestive heart failure responds to medical treatment, but relapse occurs on attempting very slight physical exertion; or where there is effort angina of severe degree. Patients with relatively high initial metabolic rates and not too advanced in years are most suitable.

The patient described had suffered from effort angina though not of severe degree; she had never shown congestive failure, but on the other hand there was a probability that the future had this in store for her. All things considered, it seemed justifiable to remove the pathological thyroid completely and by producing moderate or mild myxœdema hope to improve the prognosis from the cardiac point of view and perhaps abolish the anginal pain. After a period during which the mental symptoms were temporarily aggravated the thyroidectomy has had a strikingly good effect. She is now able to do a hard day's work, including scrubbing, without distress, whereas formerly she lived a life of miserable inactivity. Not the least instructive result of the treatment adopted was the sequence of mental changes—at first a deterioration, but soon after a remarkable improvement. But whether or not the attacks characterised by tachycardia, pallor, and tremor, and which suggested a general sympathetic stimulation, were of psychic origin is a question difficult to answer. However, like the other symptoms, their disappearance has followed an entirely physical procedure.

REFERENCES

Amberg, S.: Libman Anniversary Volumes, New York, 1932, vol. i., p. 55.
Blackford, L. M.: Arch. Internal Med., 1928, xli., 702.
Blumgart, H. L., Levine, S. A., and Berlin, D. D.: Ibid., 1933, li., 866.
Blumgart, H. L., Riseman, J. E. F., Davis, D., and Berlin, D. D.: Ibid., 1933, lii., 165.
Brown, J. W.: THE LANCET, 1934, ii., 924.
Eppinger, E. C., and Midelfart, P. A. H.: Amer. Jour. Med. Sci., 1933, clxxxv., 528.
Evans, W.: Quart. Jour. Med., 1933, ii., 1.
Grollman, A., and Ferrigan, J. P.: Arch. Internal Med., 1934, liii., 35.
Levine, S. A., Cutler, E. C., and Eppinger, E. C.: New Eng. Jour. Med., Oct. 5th, 1933, ccix., 667.
Loriga, G.: Riv. Clin. di Bologna, 1887, vii., 529.
Strassmann, G.: Beitr. z. gerichtl. Med., 1922, v., 91 (quoted by Blackford).
Ulrich, H. L.: Amer. Heart Jour., 1932, vii., 641.

MEDICOTHORAX

A NEW FORM OF ARTIFICIAL PNEUMOTHORAX

BY VILMOS MÜLLER, M.D.

ROYAL COUNCILLOR; SENIOR PHYSICIAN TO THE PULMONARY SECTION OF THE PRINCESS MAGDALENA POLYCLINIC, BUDAPEST

HITHERTO in artificial pneumothorax only pure atmospheric air, or one of its constituent gases, has been used. Its purpose has been to immobilise the diseased lung merely by its mechanical action, which has to be maintained by repeated fillings. It appears never to have been suggested, however, that the gas introduced should act pharmacologically as well as mechanically. It occurred to me that the disinfectant solution formerly used for inhalation could be conveyed to the diseased lung by means of the air injection of an artificial pneumothorax. Nasal inhalation, limited as it was by the failure of the drugs to reach the smaller bronchioles, is contra-indicated in pulmonary tuberculosis because it opposed the basic principle of rest, the forcible "lung gymnastics" entailed in its administration often producing an unexpected and sometimes fatal hæmorrhage. To carry this idea into effect was not, however, as easy as I first thought, but eventually, after several barren experiments, the Berlin firm Inhabad Gesellschaft made an apparatus that can be managed as easily as the ordinary one.

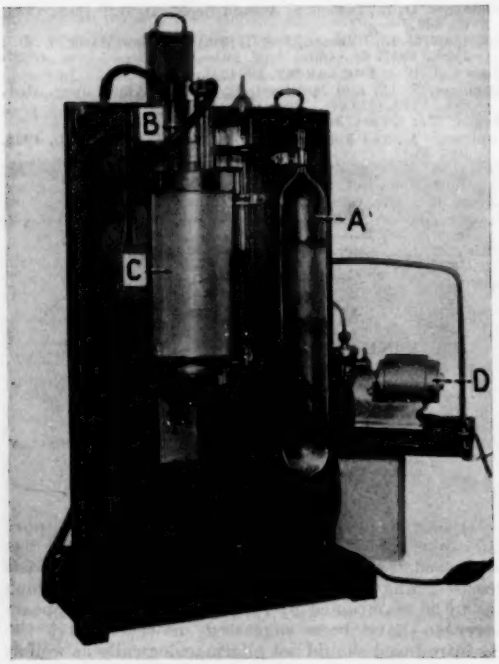
In the first set the drug was vaporised by hand by means of a rubber bulb. Since then I have perfected this clumsy method by the aid of electricity, as shown in the Figure; the device is called the "electro-inhalator." When filling the lung the electric motor is set in motion for some minutes, whereupon the mixture of drugs, given below, is transformed into vapour, which is then conducted to the air container of the pneumothorax set. The induction is exactly as in the ordinary method.

I use the following formula for the vapour:—

Gomenol Myrtol	āā	5·0	gramme.
Chloretone Menthol Thymol	āā	0·5	,,
Camphor trit. ..	..	10·0	,,
Ol. Eucalypt. ..	..	35·0	,,

The whole of this quantity is used at a single filling.

In this way we introduce into the pleural cavity not simple atmospheric air, but air that is saturated with strongly antiseptic drugs—that is to say we directly sterilise the diseased lung. Thus we accomplish two very important purposes: first, during the period of treatment, carried on for months, we



The Medicothorax apparatus.—(A) Pneumothorax apparatus. (B) Flask containing the medicated vapour. (C) Flask containing the drug to be vaporised. (D) The electro-inhalator pump.

surround the lungs with a disinfectant medium, and, secondly, this disinfecting air-layer comes into contact through the regular respiratory gas-exchange with the whole of the infected organ too. This is confirmed by the fact that the patient's breath, after an induction by my method, in a few moments acquires the odour of the vapour.

The new method adds to artificial pneumothorax two other very important advantages. As is generally known the present treatment causes an exudate in 80 per cent. of the cases.[1] Even if the exudate generally runs an uncomplicated course and requires surgery only in exceptional cases, its occurrence is very inconvenient. The first and most striking result of the medicothorax treatment is the almost complete lack of this exudation. This alone is a proof that sterilisation in the pleural cavity actually takes place and that pleurisy is wholly avoidable. This single advantage alone should recommend the method, but we were also able to promote quicker healing. We could establish beyond all doubt that during treatment the detoxication, and accordingly the return of the patients' temperature to normal, sets in much earlier than with other methods. The bacilli, as shown by the Gaffky scale, disappear from the sputum much sooner and there was a considerable increase in weight.

Medicothorax therefore eliminates, on the one hand, the commonest complication of artificial pneumothorax and, on the other, it leads to quicker healing of the diseased lung, and is a more intensive treatment than any other method. For these reasons I think it deserves a place in the modern treatment of phthisis.

REFERENCES

1. Schmidt-Giessel: Die Lungentuberkulose, Leipzig, 1935.
2. Franck, R.: Moderne Therapie, Leipzig, 1936.

CONGENITAL TOTAL COLOUR-BLINDNESS

BY ALLISTER M. MACGILLIVRAY, M.D. St. And., D.O.M.S.

OPHTHALMIC SPECIALIST TO THE FIFE COUNTY COUNCIL; LECTURER IN CLINICAL OPHTHALMOLOGY, UNIVERSITY OF ST. ANDREWS; AND

A. SHEILA MACLEOD, M.B. Edin., D.P.H.

AREA MEDICAL OFFICER, FIFE COUNTY

CONGENITAL total colour-blindness is a condition of extreme rarity. The first case was discovered by Huddart in 1777. After an extensive survey of the previous 147 years, Dr. Julia Bell,[1] writing in 1926, reported that she could find records of only 119 cases. In 1933 Geldard [2] published a case, and mentioned that it was only the eleventh case to be recorded in America.

To the completely colour-blind person only black, grey, and white are visible, and the spectrum appears to them as a colourless band of varying degrees of brightness. A definite syndrome, consisting of the following signs and symptoms, is associated with the condition: (*a*) amblyopia; (*b*) photophobia; (*c*) nystagmus; (*d*) shortening of the red end of the spectrum; (*e*) displacement of the brightest portion of the spectrum from the yellow towards the green; (*f*) central scotoma.

No obvious cause for the amblyopia has yet been discovered. The fundi usually appear normal, and any refractive error present is, as a rule, quite insufficient to account for the poor visual acuity. Parsons [3] suggests that the condition is due to an absence of cones at the maculæ. Bell [1] points out that consanguinity of the parents has been found in 27·4 per cent. of the recorded cases.

In view of the rarity of the condition, the following case is considered worthy of publication.

CASE RECORD

The patient, a boy aged 12, was kept under observation at a child welfare clinic from birth until school age. Since then he has been examined periodically at a school clinic. There is no consanguinity of the parents, nor, as far as can be ascertained, is there any family history of total congenital colour-blindness. It is very unlikely that there has been total congenital colour-blindness within the last three generations. The serious incapacity produced by the three outstanding signs and symptoms—amblyopia, nystagmus, and photophobia—would surely have been noted by relatives.

No ocular abnormality was noticed at birth. At 10 months, and thereafter for several months, nystagmus was noted, and there was also an intense photophobia. Dr. A. Rowand,[4] who has kindly given us access to his

records, observed that the child was dazzled by light, and could not look up in bright light, although there was no sign of any conjunctivitis to account for this. Since then, the photophobia has been a constant and prominent symptom. No nystagmus was visible when the child was examined at 2½, and again at 4½. On the latter occasion Dr. Rowand records that "the nystagmus appears to have ceased, but the child cannot yet face the light." During the pre-school period the child could not be permitted to play outside, since his inability to face the light made it dangerous for him to move about in traffic, not only in bright sunny weather but even on dull days. When he attained school age he was examined at regular intervals of six months at a school clinic. Amblyopia was found to be present, the visual acuity being 6/36 in each eye, not improved after correcting a low degree of myopic astigmatism. This amblyopia was at first regarded as the result of a lateral nystagmus, which had again become apparent. Albinism, conjunctivitis, and corneal ulcers having been eliminated, the photophobia was judged to be a species of habit spasm, since it was not evident in artificial light. This absence of photophobia in artificial light remains the same to-day and is of particular interest, suggesting as it does that the photophobia may be the direct result of an intolerance to ultra-violet rays. The boy is able to tolerate a powerful electric lamp—e.g., the beam of a Mackie slit-lamp, brought quite close to the eyes—without any undue desire to close them. Later he was discovered to be totally colour-blind.

At present his visual acuity remains the same—6/36 in each eye, with and without correcting lenses. The vision was tested in varying degrees of illumination, but no appreciable improvement could be discovered in lowered illumination, such as has been reported by some observers. He can read Jaeger 1 at 7 in. There is a fine lateral nystagmus and marked photophobia. The fundi show nothing pathological, both optic discs being normal.

Prof. H. S. Allan and Dr. D. Jack, of the department of physics in the University of St. Andrews, very kindly examined the boy with the spectroscope in the physics laboratory of the university. The spectrum appeared to him colourless, as a series of graduated brightnesses. Although the violet end was normal in luminosity, there was a definite shortening of the red end and a displacement of the brightest portion from the yellow to the green. Each eye was examined separately on two or three occasions, and the boy was quite definite in his statements. The fields of vision were mapped out and found to be slightly contracted in the lower nasal areas. The colour fields were charted on a Lister perimeter with 5 mm. discs of blue, yellow, red, and green. These discs of course were seen as varying shades of grey, but they approximated to the fields for white, and did not show their usual contraction. It was found impossible to plot out the presence or absence of a central scotoma with any degree of accuracy.

Tests for colour-blindness were made by the following methods: (*a*) Ishihara's, (*b*) Nagel's, (*c*) Holmgren's wools, (*d*) Board of Trade lantern. By them he was found to be totally colour-blind. It was also apparent that, although he had no idea of colours, he nevertheless possessed a keen sense of *shade;* that is to say, he could classify all colours according to their degrees of luminosity. When tested by the Board of Trade lantern he designated light red as a dark grey. The deeper shades of red appeared to him as increasingly darker shades of grey, and were finally confused with black. The lightest shades of yellow and green he called white, but insisted that the "whiteness" of the green was brighter than that of the yellow, thus confirming the result obtained by the spectroscope—a displacement of the brightest part of the spectrum from yellow to green.

The boy's general health is good. Although he is a year behind his age at school, his intelligence quotient, as estimated by the Stanford revision of the Binet-Simon test, is 100. Until the nature of the condition was fully recognised, his lack of knowledge of colours was no doubt attributed to "backwardness." Coloured chalks and paper play an important part in the infant class curriculum, and the child must frequently have been at a

(*Continued at foot of next column*)

BRITISH MEDICAL ASSOCIATION

MEETING AT OXFORD

SECTIONS OF MEDICINE AND SURGERY

At a joint meeting of these sections, with Prof. G. E. Gask, president of the section of surgery, in the chair, a discussion on the

Surgery of Pulmonary Tuberculosis

was opened by Dr. J. Gravesen (Denmark). All effective surgical measures for treating pulmonary tuberculosis were, he said, extensions of the principle of the artificial pneumothorax. The value of this procedure was generally accepted, but its failure in the presence of localised or general pleuritic adhesions made some further operation necessary. The type and extent of this depended on the surgeon's views about the means by which the pneumothorax achieved its results. He himself thought that relaxation of the elastic expansion of the lung was the factor of importance, allowing, as it did, the retraction of the healing tissues, and more particularly, of the walls of a cavity. He therefore did not aim at maintaining a positive pressure with a view to immobilisation of the lung, nor did he regard total collapse of the lung as desirable. The object of his treatment was "selective relaxation" of the affected part of the lung, whether apical, upper-lobe, or lower-lobe, and his operative measures were directed towards making that relaxation as complete as possible. In a minority of cases, variously given as 5–10 per cent., there were no adhesions, and these cases showed satisfactory relaxation with artificial pneumothorax. This should nearly always be tried first. Unfortunately adhesions tended to be localised around the diseased part of the lung, and the quite unsatisfactory result was that the healthy part of the lung collapsed, leaving the affected part expanded. The patient was worse off than before, since the healthy part of his lung was out of action and the unhealthy part was unable to heal. In such a case he strongly disapproved of attempts to force closure of a cavity by increasing the positive pressure in the pneumothorax. The introduction of the thoracoscope and cauterisation of the adhesions was often of great value and might give a permanently good result. Where it was apparent that division of adhesions was impossible, or would not give effective relaxation, a choice of three more drastic methods of treatment remained—division of the phrenic nerve, apico- or pneumo-lysis, and thoracoplasty. Oleothorax and a combination of pneumothorax with local operative treatment Dr. Gravesen condemned. Interruption of

(*Continued from previous column*)

loss. Added to this, his poor visual acuity and photophobia must always have proved a serious handicap.

It is difficult to suggest a suitable occupation for this boy in adult life. He is compelled to wear dark glasses in daylight, and this, coupled with the amblyopia and total colour-blindness, will limit his choice very considerably.

REFERENCES

1. Bell, Julia: Total Congenital Colour Blindness. Eugenics Library Memoir, XXIII., Treasury of Human Inheritance, vol. ii., London, 1926.
2. Geldard, F. A.: A Case of Congenital Total Colour-blindness, Jour. Optical Soc. of Amer., 1933, xxiii., 256.
3. Parsons, Sir John: Diseases of the Eye, eighth edition, 1936.
4. Rowand, Dr. A.: Records of St. Andrews Child Welfare Centre, and of the James MacKenzie Institute, St. Andrews.

the phrenic nerves, whether by evulsion, crushing, or alcoholisation, he reserved for attempts to close cavities in the lower lobe, in the middle field or near the hilum. On the whole he was not impressed with the usefulness of the method: all it did was to reduce considerably the function of the lower lobe, which was contrary to the principle of selective relaxation and might be definitely disadvantageous.

Before a major surgical operation was undertaken it was important that the disease should have reached a certain phase. Operation during an active stage of the tuberculous process was wrong and could do no good. In some acute cases the tendency was downhill all the time and a safe period for operation might never come; while in other cases, recovery from a single acute exacerbation might be so complete that the indication for operation might never arise. As a rule, however, pulmonary tuberculosis had an undulating course, with a downhill tendency, but with phases of general and local improvement. The surgeon's problem was to find the phase during which the patient's resistance was temporarily on the upgrade. The behaviour of the temperature and of the body-weight were valuable criteria, but they were not absolutely reliable. At the time of operation the blood sedimentation-rate ought to be falling, and it was wise to postpone major operations whilst the blood picture showed an abnormally high proportion of young leucocytes. The most valuable evidence of localisation and arrest of disease in the lung itself was provided by serial radiograms. Fresh foci of infection and signs of spread in the lung tissue were evidence that retraction of the lung tissue was unlikely, and it was only when the lung was in a condition to retract that operations to reduce the elastic tension were justified. Bilateral disease did not contra-indicate operation as long as the stage of increased immunity and local demarcation had been reached. Summing up the indications for treatment, Dr. Gravesen said that artificial pneumothorax could be performed, or at least attempted, without fear of any serious effect on the patient's reserve, and it should not be delayed till adhesions had already formed. Major surgery was as well kept in the background till the evidence of spontaneous healing and of general immunity justified it as an additional step designed to make Nature's cure permanent instead of temporary.

Of the methods available, apicolysis combined with plombage, when it was undertaken after exact localisation of the cavity, he considered a very elegant operation. It was certainly the most selective of all the forms of treatment, and made little demand on the patient's reserves. The great objection to it was that the wax introduced into the cavity acted as a foreign body and led to complications. Nor did he think it as effective as thoracoplasty. In this latter type of operation, he believed, the right tendency was to make the procedure as localised as possible, but at the same time very thorough. Cavity formation was the real indication, and the object must be to close the cavity as completely and as early as might be. Concentric contraction was the aim, and the lung must therefore be freed so as to allow it to retract not only towards the mediastinum but also from above down and antero-posteriorly. The two types of operation that he most favoured were the "upper partial," in which six or seven ribs were resected, and the "apical" with resection of four or five ribs. The two upper ribs might have to be removed in their entirety. The "total" or "subtotal" thoracoplasties he reserved for the larger empyemas and for the more extensive affections. His figures showed a definite decline in mortality in the last 200, as compared with the first 200, thoracoplasties. At the end of the first, second, and sixth weeks respectively the deaths in the first 200 cases were 5½, 7½, and 12½ per cent., while the corresponding figures for the second 200 cases were 2, 5¼, and 9 per cent. An increasing proportion of patients became fit for work; thus whereas with the older methods of artificial pneumothorax, without other aid, 37–42 per cent. of the patients were considered fit for work in the fifth year after discharge, now, with the use of thoracoplasty operations, 67–74 per cent. were able for work at this period. Dr. Gravesen was able to report that all of his patients had been traced.

DISCUSSION

Dr. F. G. CHANDLER (London) said that the principle of the pneumothorax treatment was now accepted without question, and there could be no doubt of its value. The presence of adhesions might be a definite difficulty, since with re-expansion of the lung the cavity might reopen. He advocated division of the adhesions, if possible using a thoracoscope. There were certain complications of this method, amongst them empyema, hæmorrhages, and surgical emphysema, but with experience these complications became less common, and, in his last 100 cases, there had been no example of empyema. Diathermy was of value. He thought that oleothorax was definitely useful in the case where obliterative pleurisy occurred and the lung must not be allowed to expand. In these cases oil alone would hold the surfaces apart. It was true that high pressure might arise in the pleural cavity by upward expansion of the lung, but the oil did not come through to the lung substance. Thoracoplasty was a big operation and often a mutilating one. In certain cases, where all that could be hoped for was a prolongation of life, the question arose whether this was sufficient compensation for the severity of the operation. The issue was uncertain. It was most important that the surgeon should know exactly what was the indication for operation in any case, and be familiar with every stage of the technique. The cavity must be of the type that would be likely to heal, and thoracoplasty the treatment that would be best designed to help it to heal. He agreed that bilateral disease was not a contra-indication.

Mr. WILLIAM ANDERSON (Aberdeen) said his remarks were based on his experience of 80–90 major surgical cases. He had not used plombage. He did not think that relaxation was the only factor by which artificial pneumothorax obtained its results: diminished movement was of importance, the so-called splinting of the lung. This was of more than academic interest, for the complete removal of the first rib was designed to lessen movement, and the prevention of regeneration of bone after rib-resection was only justified if continued immobilisation was the aim. The results of phrenic nerve evulsion varied, and he felt that its effect could not be explained on mechanical grounds alone. Possibly the phrenic nerve exerted through its sympathetic fibres a direct effect on the pulmonary innervation. He found the operation useful for patients who would not stand more severe measures, but personally he was doing fewer of these operations than he used to. He was sure that they were not of value as a preliminary to thoracoplasty; for one thing, the cough mechanism was interfered with. In choosing the time of operation, the opinion of the attendant physician was the most important. He also considered the mental attitude of the patient to the disease, and his reaction to the bouts of acute

auto-inoculation. Radiograms might be used too much, and too much might be read into them. The two points he emphasised in the actual technique of the operation were that it should be carried out in stages, so as to minimise the amount of shock, and that blood transfusion should be used. He found that patients on the whole stood the operation well, but that their convalescence was smoother if they had been transfused. His objection to the local, or limited, thoracoplasty was that it put a strain on the lung at the edge of the affected part, where the disease was liable to spread. He did not now allow his patients to wear compression belts during convalescence, but preferred weights (up to 7–12 lb.) worn under the bandage. His advice was to try pneumothorax first, and when it failed, to consider thoracoplasty.

Dr. GEOFFREY MARSHALL (London) said that he could not help thinking how surprising this discussion would have seemed even three or four years ago. It almost seemed as if the old order had been reversed: tubercle was once divided into pulmonary tubercle (the province of the physician) and surgical tubercle, involving bones and glands (in which operation was undertaken). At the same time it must be clearly realised that surgical operations did not cure tuberculosis, even in the lung. The indications for the operation had been more clearly defined at this meeting than he had previously heard them. The one real indication was cavitation, and for definition of the cavity a good stereoscopic radiogram was needed. A cavity 2–3 cm. in diameter seldom healed without relaxation, and it must be remembered that, apart from the patient's own prognosis, the cavity discharging tubercle bacilli was a danger to the community. Dr. Marshall was particularly insistent on the importance of dividing even long narrow adhesions, which though they might stretch sufficiently to allow collapse of the lung, were liable to lead to a disappointing result in the long run. The cavity might never collapse. He agreed that the results of phrenic evulsion were poor, but some surgeons seemed to get better results than others. There was a real need for some plugging material, better than paraffin, to improve the results of plombage, for the operation had possibilities. At present thoracoplasty was the one efficient method when artificial pneumothorax had been indicated and had been found unattainable. He thought that selectivity could be overdone in collapse operations. There were cases known in which death had resulted from tearing of the lung or from sudden spread of the disease.

Mr. C. PRICE-THOMAS (London) said that to regard tuberculosis as a general disease, with the pulmonary lesion as a local manifestation, was dangerous. It was much more valuable to look on the pulmonary disease as primary, because if the toxic absorption from the lung could be decreased—as it was by an artificial pneumothorax—the general resistance increased. The rest given by pneumothorax led to a decrease in lymphatic drainage. X ray appearances were valuable in assessing the extent of adhesions. Thoracoplasty was undoubtedly a very severe operation, but it had to be remembered that the patients were beyond other help, and so a certain amount of generosity was needful in assessing the results.

Mr. J. B. HUNTER commended the operation of phrenic evulsion. The strain on the affected side of the chest was released by the diaphragmatic paralysis, but he agreed that without other aid it would not close a cavity. In fibrosis it might be of great help to the patient.

Dr. PARRY MORGAN said that an important point in the technique of artificial pneumothorax was that the gas should not be allowed to enter without free oscillation of the pressure. He used two manometers.

Mr. F. RONALD EDWARDS thought it important to remember that the disease was often more extensive than radiography indicated. He was in favour of somewhat extensive thoracoplasties. Unless a rib was sufficiently freed, it might not collapse, as it should, like a bucket-handle.

Mr. HUGH REID was of opinion that the watchword in pulmonary tubercle, as in tubercle elsewhere, was rest. Phrenic evulsion as a method of treatment had been overdone and underdone. He believed that with careful selection of cases it could give very good results. Adhesions should be enucleated from the chest wall and not just divided. He did not use diathermy. He did the operation of thoracoplasty in three stages, and he removed the transverse processes. Shock might be considerably lessened by blocking the ganglia by local anæsthesia.

Dr. GRAVESEN, in reply, warned his audience not to allow thoracoplasty to be too widely practised. He thought it much better that it should be concentrated in one or two centres where it could become specialised.

SECTION OF PHARMACOLOGY AND THERAPEUTICS WITH ANÆSTHETICS

THE second session of this section, held under the presidency of Prof. J. A. GUNN (Oxford), considered the

Present Status of Cyclopropane

the discussion being opened by Dr. RALPH M. WATERS (Madison, U.S.A.). He proposed, he said, to deal with recent work on this drug which, in his opinion, must still be regarded as in the experimental stage. The solubility of present market samples of cyclopropane at 37·5° C. had been determined by Orcutt as follows: 1 c.cm. of water dissolves 0·204 c.cm. of the gas; 1 c.cm. of oil dissolves 6·99 c.cm.; 1 c.cm. of human blood dissolves 6·457 c.cm.—giving an oil-water ratio of 34·3. Seevers and Bennett had found that concentrations of cyclopropane ranging from 1½ to 4 per cent. definitely depressed or abolished sensory stimuli from skin and mucous membranes without interfering with consciousness or volition. If induction were made by very gradually and slowly increasing the cyclopropane concentration in the anæsthetic atmosphere, allowing time for at least a partial equilibrium to become established between alveoli, blood, and tissues, doubtless the wide variation in effective concentrations found for the different degrees of narcosis might be reduced and much lower averages would be obtained. Clinical experience had taught that the temptation to use higher concentrations than were necessary was very difficult to resist. The abundant oxygen possible in the anæsthetic atmosphere gave the anæsthetist a feeling of confidence and at the same time of impatience at waiting for the effect he desired. The irritant property of ether vapour prevented a similar mistake being made with that agent. Owing to the fact that cyclopropane was practically devoid of irritation, extremely rapid induction with dangerously high concentrations was possible.

With regard to the effect on respiration, in a case cited it was evident that no increase in either rate or tidal volume of respiration occurred after cyclopropane flow was begun, but rather a very gradual decrease in depth but not in rate until fourth stage anæsthesia was reached with intercostal paralysis. At this point a period of increased rate began,

insufficient in depth to maintain efficient exchange. Thus cyclopropane caused as a rule no respiratory stimulation even during induction, and with gradually increasing dosage very slight respiratory depression occurred until a concentration was reached that would shortly result in respiratory arrest. With avoidance of high concentrations at any time, a more complete stabilisation of tensions in various parts of the body would result, with manifestly added safety. A concentration arresting respiration quickly (within three to five minutes) might be extremely toxic to the heart. The present figures for effective concentrations were:—

1st stage	.. ..	7 per cent.
2nd stage	.. ..	13 ,, ,,
3rd stage	.. ..	23 ,, ,,

Respiratory arrest 40 per cent. and over. These figures needed revision and must be regarded with great caution.

In considering the circulatory system, Dr. Waters stressed the importance of watching carefully and continuously the peripheral pulse, especially during marked respiratory depression. Following the occasional recording of ventricular tachycardia in electrocardiographic tracings taken during cyclopropane anæsthesia in both animals and clinical patients, and the recognition of ventricular tachycardia preceding ventricular fibrillation from whatever cause, cardiac studies were continuing. It could be seen from tables shown on the screen that the incidence of palpable arrhythmia with cyclopropane increased with depth of anæsthesia, and experiments had proved that doses of intravenous adrenaline, which frequently precipitated ventricular fibrillation in dogs during light chloroform anæsthesia, failed to do so under light cyclopropane, but did so under very deep cyclopropane with high concentrations and respiratory arrest. A safe reaction included a moderate decrease in pulse-rate. Beyond this, if cardiac damage were occurring, the sequence of events would probably be: first, a further slowing of the pulse to 50 or below, then either an arrhythmia or tachycardia, presumably to be followed by ventricular fibrillation. The instant extreme bradycardia, arrhythmia, or tachycardia appeared, the concentration should be reduced at once. Present knowledge would point to the avoidance of rapid inductions and high carbon-dioxide tensions, and to the administration of adrenaline as a resuscitative measure.

Dr. Waters said he had been unable to find any clinical or experimental evidence that cyclopropane raised blood pressure. If this occurred, it could be explained by carbon-dioxide excess, oxygen deficiency, or respiratory obstruction. Before considering direct drug action to be the cause of rising blood pressure, very careful consideration should be given to possible technical faults and particularly to the likelihood of inefficient carbon-dioxide control. Burford suggested that a safe method was to put enough cyclopropane into the bag to induce anæsthesia, and then to cut down the flow to make up what was used in the tissue—an amount less than 100 c.cm. per minute. During experiments on the effect of cyclopropane on the gastro-intestinal tract, Meek had found that in normal dogs with Thiry intestinal loops, both circular and propulsion phenomena were inhibited or arrested in deep anæsthesia. Prompt return to normal occurred on removal of the mask, and in some cases an increase over the normal occurred during recovery. Clinically—in a series of 10,000 cases divided between nitrous oxide, ethylene, cyclopropane, and ether—post-operative distension, nausea, and vomiting occurred in the greatest percentage with ether, followed by cyclopropane.

He concluded by repeating that after six years' experience he still considered the drug to be experimental, but felt justified in continuing its clinical use and recommending it to others who were competent to study its effects and recognise its dangers.

DISCUSSION

Dr. D. DIVINE (Hull) said he had administered the drug in 92 cases of different surgical varieties, and that while it was completely satisfactory to the surgeons and nursing staff, he had been worried himself by the variations in pulse-rate. Even with frequent changing of the soda lime in the closed circuit the arrhythmia still occurred—possibly due to the length of dead space in the circuit.

Dr. E. LANDAU praised the drug in chest surgery owing to the diminution of respiratory movements.

Dr. M. D. NOSWORTHY asked for information about premedication and whether ventricular fibrillation occurred without the administration of adrenaline.

Dr. H. F. SIMMONDS reported one death in his series of cases, following appendicectomy. Respiration was normal, but the heart stopped, and in spite of every effort the patient died with the heart in ventricular fibrillation.

Dr. R. B. GOULD expressed anxiety because of the difficulty of appreciating the depth of anæsthesia. He also found that there was a high incidence of post-operative vomiting and increased salivation, and that much morphia was necessary during recovery. His general impression was that there was less post-operative shock with this drug, especially in long cases.

Dr. J. CHALLIS asked for an explanation of the fact that he himself and other occupants of the theatre frequently complained of headaches after cyclopropane had been administered to a patient.

REPLY

Dr. WATERS said the technique of the administration of cyclopropane was to be discussed in London later. He considered that much of the trouble experienced at present was due to over-dosage owing to defective apparatus. The flow must be minute and absorption technique improved. Slight leakage in the current could cause headache in those present in the theatre. With regard to premedication, he advised small doses of morphia—generally gr. $\frac{1}{4}$ an hour and a half before operation. Adrenaline must be avoided in the treatment of collapse.

SECTION OF OTO-RHINO-LARYNGOLOGY

AT a meeting of this section, with Mr. LIONEL COLLEDGE, the president, in the chair, a paper on

Otomicroscopy

was read by Dr. E. LÜSCHER (Berne). It was illustrated with lantern slides of coloured sketches of views obtained with the otomicroscope, and every point brought out by the lecturer was illustrated in this way. He said that he had been working on this subject for ten years. The instrument magnified the image of the drumhead 10 to 50 times, thus bringing into view things previously invisible with the Siegle speculum or the ordinary otoscope. The method had now reached the stage of practical usefulness, as well as being an instrument of scientific investigation. He said that a pronounced stereoscopic view was obtained even though one was observing with monocular vision. The drum membrane was normally immobile, not affected by respiratory or circulatory movements. Degenerative

changes were common, occurring chiefly in the deeper portion of the fibrous layer. A little massage brought out the blood-vessels and a three-dimensional picture was obtained. The vessels were capillaries and veins, and the stream of blood was irregular and not very copious. The blood pressure averaged 32 to 136 mm. of water, as measured by observing the pressure necessary to obliterate the vessels by pumping air through a Siegle speculum.

In showing a drawing of a drumhead from a case of influenzal otitis he pointed out how localised swellings of the drum were clearly distinguished from a bulging. Small hæmorrhages also occurred. A peculiar "marbling" appearance of the drum he had found to be diagnostic of mastoiditis, and he now performed a mastoid operation whenever he saw this. By examining in a routine manner all cases of tuberculous disease, whether they complained of aural symptoms or not, he had been able to see changes due to tuberculosis in very early stages. The earliest findings were minute vesicles, too small to be seen by other methods of observation. These were not real tubercles and might be a toxic, allergic stage. He thought they might be analogous with phlyctenular nodules in the conjunctiva. Later the vessels became dilated and tortuous, and occasionally were observed to pulsate. The drum was otherwise pale, and the whole appearance was diagnostic of tuberculosis. The vessels then disappeared in localised areas, where the membrane assumed a dirty white colour; these were true tubercles. Perforations then appeared in these places, quite suddenly, since they were avascular and fell to pieces. The clinical observations of multiple perforations, or perforations large from the start, were thus explained by direct vision.

He had seen an interesting series of views of drum membranes in cases of chronic suppurative disease of the middle ear, and he thought that some of them showed stages in the formation of cholesteatoma. He indicated in a drawing of a marginal perforation how the epidermis was growing into the middle ear, perhaps the first stage in the formation of a cholesteatoma. Black spots on Shrapnell's membrane were never perforations but aeras of atrophy, and in a series of slides he indicated how actual perforations occurred at this site. The membrane became indrawn, forming a sac, which for some reason unknown perforated at the invisible apex. Cholesteatoma subsequently appeared, coming down into view from the attic. He also pointed out certain forensic uses of the method in cases of trauma. In large perforations with exposure of the ossicles and the stapedius muscle he had been able to study the acoustic-cochlear reflex. He had found that the muscle contracted even with very soft sounds, and thus had a protective action throughout normal life. This type of observation could be readily applied to the investigation of the physiology of the middle-ear contents. Finally he showed an illustration of a rarity—the jugular bulb showing through the atrophic drum of a case of chronic catarrhal disease. He claimed that otomicroscopy brought a new refinement to diagnosis and therapeutics, and might be an addition to the research worker's equipment.

Mr. F. J. CLEMINSON (London) said that he was interested in the distinction between scars and atrophies, and in the development of cholesteatoma.

Mr. E. D. D. DAVIS (London) said that he had used the instrument, but had not been able to focus properly. He would very much like the opportunity of acquiring one, but the expense was considerable. He had, with the ordinary methods at his disposal, observed movements of the drum with respiratory movements. He was interested in the account of the formation of tuberculous perforations, and the instrument here was of great value in early diagnosis. Clinically, these cases were marked by considerable deafness and little pain. In accident and compensation claims the instrument was a powerful weapon in the otologist's hands.

Mr. T. B. JOBSON (Guildford) thought that cholesteatoma was not as a rule formed in the tympanum, but in the attic.

Mr. M. VLASTO (London) asked Dr. Lüscher whether he had noticed any alteration in the function of the stapedius in cases of facial palsy.

Mr. T. A. CLARKE (Canterbury) mentioned that he had often seen with a Siegle speculum what appeared to be perforations in Shrapnell's membrane. Was this not the case?

Dr. LÜSCHER, in reply, deplored the cost of the instrument, which was increased by heavy duties. He agreed with Mr. Davis that movements of the drum were seen occasionally, but he was describing the average normal case. He would not like to enter into any controversy about the formation of a cholesteatoma, but he thought it was always formed from the outside by accumulation of ingrowing epithelium and desquamation. He had merely observed that Shrapnell's membrane was always indrawn in these cases. The appearance of perforation of this membrane was due to the folds produced by the indrawing, the actual perforation being invisible; the otomicroscope here showed its superiority over the Siegle speculum. He regretted that he had not had an opportunity of observing the stapedius muscle in a case of facial palsy. He added that he was unable to give any explanation of the function of the tensor tympani muscle, since the drum had never been observed to move with hearing.

Dr. G. E. MARTIN (Edinburgh), reading a paper on

Hearing Aids

said that it was the duty of the otologist, in the case of a patient whose hearing he had failed to improve, to see that a suitable aid was obtained. He described the various types of non-electrical and electrical aids, and hoped that they would one day be regarded with no more curiosity on the part of the layman than spectacles. He also suggested that the vendors of these aids organise among themselves a scheme similar to that in existence among opticians. He recognised that this was not ideal, but thought that it would be an improvement on the present haphazard methods of sale. He said that the medical curriculum should include instruction in acoustics, and that the use of the audiometer should become more common in the specialty. He welcomed the greater attention now being devoted to the whole problem.

A paper by Mr. CLEMINSON and Mrs. P. M. T. KERRIDGE (London) on the same subject was read by the latter. She said that hearing tests might be designed to elucidate a particular type of deafness or to discover an early defect. They were of two kinds: first, those that depend on the ability to hear words, such as voice tests and the gramophone audiometer; and, secondly, tests with pure tones, tuning-forks, audiometer, &c. Both have advantages and disadvantages. Voice tests do not suffice for the early stages of disease, and also give no standard of comparison among different observers. They also only investigated the middle register, and disease changes were often only detected in the early stages by defects appearing in the upper or lower registers. The audiometer could be used to carry out tests on many people at the same time, and was easily used

with children; the results obtained could be compared with those of other observers at different times. The tuning-fork is the most used method of testing with pure tones, and in this connexion she emphasised the impossibility of an increase in bone conduction, often stated to exist. Bone conduction might not be impaired, but it could not be increased, and the fallacy was easily demonstrable if the observer closed his own meatus during the test, or took the patient into a silent room. High-pitch forks "faded" so quickly that there were large experimental errors in determining the bone conduction. She thought that the audiometer had the defect of expense, but it had many advantages that made it in her opinion the best method of all, and not entirely a weapon of research. The fear that its results are invalid because the use of an earphone produces a mixture of air, cartilage, and bone conduction had been shown to be unfounded.

She divided hearing aids into three groups—resonators and non-electrical instruments, microtelephones, and valve amplifiers. Both of the latter types could be fitted with receivers for either air or bone conduction. Exact prescription of aids was rarely achieved, and knowledge of three factors is necessary: (1) the physical characteristics of the deafness; (2) the amount of sound magnification of the hearing aid throughout the auditory range, and the extent to which this could be varied; (3) the degree of the exactness of fit of the first and second required for the understanding of speech. The first could be adequately measured by the audiometer or calibrated tuning-forks, but the second was not available for the commercial aids (although readily obtained in a suitably equipped laboratory), and none of these instruments could be varied enough to match all varieties of deafness. The last factor was as yet an uninvestigated field, although such figures as were available for persons with acute hearing suggest that it was important. In practice, however, very good results could be obtained. Guessing from half-heard words and from the context, and the help of lip-reading was of such enormous value that the patient did not need to be given perfect hearing to be made comfortable. Non-electrical resonating instruments helped those who could hear individual conversation, but who found distant and general conversation difficult. Microtelephones suited cases of middle-ear disease and otosclerosis until the inner ear was seriously involved. The patient should be encouraged to use the most suitable aid regardless of appearance, since only increased general use will render them unremarkable. Bone-conduction hearing was not easy, and great magnification of sound was necessary, for the threshold was much lower than that of air-conduction; there was a certain amount of distortion and much individual variation; a personal trial was the only way to settle the matter. The valve amplifier should be recommended when the maximum amount of relief was required. This includes cases of inner-ear destruction, senile deafness, and deaf-mutes with residual hearing. She would like to point out that these cases could be greatly helped, but that the low and middle register magnification, as well as extraneous instrument noise, must be avoided. This type of aid was rapidly improving in quality, and a recent discovery had made them considerably cheaper. Refinements such as the crystal microphone and tone and volume controls could now be obtained. There was no doubt that the best and almost the only way of fitting the patient satisfactorily was by trial and error, even when the above indications are followed, and this should be insisted upon from the instrument dealer. Most of the reputable ones would allow it on payment of a reasonable fee for the use of the instrument, and she directed attention to the valuable advisory work carried out by the National Institute for the Deaf and to the useful pamphlets it had made available.

Mr. CLEMINSON said that he had to add to this last paper only one thing that had been brought to his mind by a recent case. He had used a small piece of cotton-wool as an artificial drum on this patient with great success, and so simple an aid must not be overlooked.

Dr. H. S. BIRKETT (Montreal) said that the subject had been exploited by instrument manufacturers. In his own practice he based his advice on tuning-fork and audiometric tests. When there was loss of the higher frequencies he advised non-electrical aids. He used the pamphlet published by the National Institute for the Deaf, and gave a copy to every deaf patient. He always insisted on patients trying an aid in their own homes, in their normal circumstances of life, before purchasing it. He considered that the artificial drum might be used more often, and regretted that it had fallen out of favour; it required complete destruction of the drumhead. Lip-reading he thought was perhaps more commonly taught in North America than in this country; young otosclerotics as well as deaf-mutes benefited enormously.

Mr. R. SCOTT STEVENSON (London) also emphasised the value of lip-reading. The National Institute for the Deaf gave in pamphlet form a list of the teachers throughout the provinces, as well as in London. It is the best of all artificial aids to hearing, and newspapers did not stress this aspect owing to the income they derived from instrument dealers' advertisements.

Mr. T. B. JOBSON (Guildford) felt that the handling of aids should be limited to a registered body, as is the supply of spectacles.

Mr. T. A. CLARKE (Canterbury) felt that this being a meeting of a section of the British Medical Association it would not be right to put on record the approval of sight-testing opticians, and that similar methods for the sale of hearing aids are equally to be deplored.

Mr. RITCHIE RODGERS (Hull) said that he always advised his patients to select an aid by trial and error, and that he strongly recommended them to learn lip-reading. In his experience, the young acquired the skill very easily, but adults found it more difficult, the difficulty increasing with their age.—Mr. F. J. G. LEISHMAN (Oxford) said that he had found from an investigation of 1000 school-children that the routine test of "forced whisper" was extremely unreliable, and he felt that it should be abolished; he too was in favour of the audiometer. Otitis media is more common than is supposed, and is often masked by the natural facility shown by the children in acquiring lip-reading.—Dr. LÜSCHER described the system in his country. Every child on entering school for the first time is thoroughly examined, and a hearing test is included in this examination. It is then equipped with an aid, and if the deafness is not relieved by this it is sent to a special school, where it is taught lip-reading. Government funds finance this procedure. There is no grant for adults, but there was a society similar to the National Institute for the Deaf. It went farther in many ways, for instance in possessing many aids and ascertaining itself the type most suited to the

patient's needs before purchasing one. It also held classes where lip-reading was taught, and it exercised generally a good psychological influence. He inquired if the Pfau "sounding-stick" was used in this country for the investigation of the higher tones, when forks were not of much use. He also found artificial drums very useful, and made them of cellophane or thin silver.

Mr. W. S. SHARPE (London) said that the fatigue during testing must be carefully watched and guarded against. He agreed that it was not yet possible to prescribe aids exactly, and that the only satisfactory method was that of trial and error. He thought that both ears could be used separately if they show different degrees of deafness and the particular range which was deficient in that ear amplified. He also agreed that children showed a natural facility in picking up lip-reading and said that this must be remembered when they were being tested by the voice.

Mr. R. J. MARTIN (Liverpool) asked whether the audiometer was satisfactory in testing the bone-conduction, also the name of the journal mentioned by Mrs. Kerridge where the description of the new valve amplifier aid was published.

Dr. MARTIN, in reply, said that he had thoroughly enjoyed Mrs. Kerridge's paper. He agreed with Mr. Jobson that authorised dealers would be an improvement on the present system. He had purposely omitted all reference to lip-reading, but he appreciated its great value, especially in children.

Mrs. KERRIDGE said that she too had deliberately avoided reference to lip-reading as not coming within the scope of the title, but she agreed with the other speakers as to its value and uses. The usual aid meant when an electrical aid was mentioned was the microtelephone and, since this magnified chiefly in the middle ranges and since senile deafness was in the upper ranges, it was not a suitable instrument in this type of deafness. Elderly people, however, required an electrical aid of the valve amplifying type. Theoretically, to use both ears in differentiating at different ranges was excellent, but in practice the ears were usually very unequal; also people were only with difficulty persuaded to wear one ear-piece, let alone two. The audiometer was now provided with a special bone-conduction ear-piece. She was rather against the establishment of registered dealers, because it was not yet possible to give sufficiently precise instructions to half-trained persons, and the subject had not yet advanced enough to be able to train them properly. It was unfortunately true that the honest dealer was a rarity. The circuits of the valve amplifier she had mentioned were due to Mr. T. S. Littler, D.Sc., of Manchester, and were published in the *Wireless World* of April 17th, 1936. He had since published a series of circuits including one of a carbon microphone.

Mr. CLEMINSON said that he first formed a vague idea of the type of instrument likely to fit from hearing tests, and then tried several in his rooms, there and then, since he possessed specimens of all the various kinds.

SECTION OF NUTRITION

A DEMONSTRATION before this section was devoted to

Disease and Diet

Sir ROBERT MCCARRISON (Oxford) showed slides illustrating the correlation between physique and diet in certain Indian tribes. He also showed the differences in rats brought about by feeding them on the diets of those tribes, and, another series of slides, illustrating the keratinisation in the mucous membrane of the trachea induced by lack of vitamin A. Analogous keratinisation, he said, occurred in the skin, causing blockage of the sebaceous glands and resulting in the condition described by Nicholls as phrynoderma (toad-skin).

Mrs. M. MELLANBY (London) demonstrated the various grades of hypoplasia seen in both deciduous and permanent teeth of man and dog. She used the term "hypoplasia" (literally underdevelopment) to cover any form of imperfect calcification, basing her standards mainly upon nutritional experiments on animals of different species. She paid particular attention to the teeth of dogs because when domesticated their diet was in many ways similar to that of man and the structure of the teeth was fairly comparable. Perfect teeth, she explained, had a smooth, white and shiny surface. The ground sections, when viewed under the microscope, were seen to possess enamel of normal thickness for the type of tooth and with none of the defects recognised at the present time. The dentine was relatively thick and contained no interglobular spaces. In contrast, hypoplastic teeth of man and dog were more or less rough, discoloured, and opaque; the denture was thin and had interglobular spaces; the enamel, which also was comparatively thin, showed in section defects such as deep pigmentation, and greater powers than the normal of staining, an indication of poorer calcification.

The demonstration included a graded series of teeth which served as standards of degrees of hypoplasia, specimens of human and dogs' teeth and stained microscopical sections to correspond, and charts made in connexion with investigations on children. These last demonstrated that the amount of caries present was associated with the quality of the structure of the teeth, and that even in hypoplastic teeth the onset and spread of caries could be delayed by increasing the vitamin D and calcium in the diet. Mrs. Mellanby also showed examples of the natural and artificial production of secondary dentine in the pulp of the tooth as a reaction to injury; this reaction was seen to vary with the diet. Mothers' diets were shown to affect, to some extent, both the deciduous and permanent teeth of the offspring.

Mr. J. D. KING, Ph.D., had found that rats' molar teeth were liable to develop fissures when the animals were given hard and coarse particles of food. The lesions originated as fractures in the enamel where the cusp inclination was greatest; that was where the brittle enamel was insufficiently supported by the more elastic dentine. Similar lesions were caused by fracture of the enamel, at the base of the natural fissures of the lower molars, by hard particles which acted as wedges and split the teeth. The stagnation of food and invasion of the dental tissues by bacteria and their products appeared to play little or no part in starting the lesions but once the fissure lesions had occurred conditions resembling caries in man were observed. The question remained whether these lesions were comparable with caries in man. In rats the lesions could be produced by softer food if the animal's teeth were imperfect from vitamin deficiency. It was possible that the same sequence of events occurred in man. Imperfect structure due to vitamin lack had been shown by Mrs. Mellanby to be common and might make teeth vulnerable to trauma even from the soft diets of modern times. Bacteria might invade the teeth through minute fissures and caries might result.

REVIEWS AND NOTICES OF BOOKS

Population Movements

By ROBERT R. KUCZYNSKI. Oxford: The Clarendon Press. 1936. Pp. 121. 5s.

Dr. Kuczynski's book reproduces three public lectures given by him in London last March and briefly reviewed in our columns at the time (1936, i., 674). Of these, the first summarises what is known of the population of the Earth and of the process by which America came to be peopled by blacks and whites. The second discusses the recent expansive trends in world population and the imminence in western Europe of new trends leading towards depopulation. It is the third chapter, dealing with the possibilities of increasing reproduction and with the reaction of public opinion to population movements, which bear most closely on contemporary problems. Among the possibilities of increasing reproduction Dr. Kuczynski considers the promotion of nuptiality and of early marriage; and the reduction of mortality before the age of fifty which is the period relevant to fertility. Nuptiality varies to a surprising extent in different countries. It is highest in Bulgaria, where in 1926 among females of 40–50 years there were only 1·3 per cent. of spinsters; and lowest in Northern Ireland where, in the same year, there were as many as 26·2 per cent. of spinsters. In England there are 17·5 per cent. and in western Europe, the author tells us, about one-seventh of all girls remain unmarried. The stimulation of nuptiality may have a big effect in countries like Ireland where the proportion of girls who do not marry is high and where few illegitimate children are born. The effect would be smaller in countries like Sweden where many girls do not marry (there are 23·9 per cent. of spinsters) but where many have illegitimate children; and it would be small in countries like France and Germany where nuptiality is high (11·4 per cent. of spinsters) and illegitimacy also high. We are not told what the effect would be in England.

What of promoting early marriages? A recent German inquiry is quoted, which shows that early marriage has a definite effect on fertility. The inquiry shows that girls marrying at twenty have 33 per cent. more children than girls marrying at twenty-five, 69 per cent. more children than those marrying at thirty, and three times more children than those marrying at thirty-five. Yet the author, for various reasons (which may not strike everybody as wholly convincing) does not think that fertility would be much increased by promoting early marriages.

What of reducing mortality? In England, of 1000 newly born girls, 907 reach the age of fifteen and 788 that of fifty. But even if no girl died before passing the reproductive age, the net reproduction rate for England and western Europe would only be raised to 0·9 (a net reproduction rate of unity being necessary to maintain a stable population). In short, with fertility as in 1933, the population of western and northern Europe would, at best, hold its own even if no new-born girl died before passing through the child-bearing age, and if none remained unmarried. How then does Dr. Kuczynski think that fertility can be stimulated? Here are his words:

"To increase fertility is a gigantic task. Fertility in the territory comprised by Western civilization is so low because most couples want few children. Even if the desire to raise children should not diminish further, fertility, as a whole, is bound to decrease as long as the most efficient birth-control devices are not universally known. A stop in the downward trend of fertility in the near future is to be expected only from an increasing desire to raise children, and a general desire for more children is hardly to be expected as long as public opinion in most countries does not favour population growth."

Though there are details of this exposition with which some may disagree, these lectures form an admirable introduction to those problems of population growth, decline, and measurement which Dr. Kuczynski has done more than perhaps any other living man to elucidate. They deserve to be widely read by all persons interested in the biological future of the human race.

World Population, its Growth and Present Trends

By A. M. CARR-SAUNDERS. Oxford: The Clarendon Press. 1936. Pp. 336. 12s. 6d.

THOUGH many studies of population have lately appeared, there is no general survey of the world situation. Prof. Carr-Saunders, in trying to fill the gap, takes as a starting-point the population of the world three hundred years ago so far as this is known, and proceeds to discuss the causes and consequences of the immense expansion of numbers which has taken place since that time. He further indicates the problems arising from the differences in fertility-rates throughout the world.

Thus the scope of the book is enormous. It begins by describing the increase of world population in the last three hundred years, estimated to amount to a quadrupling, and it proceeds to consider such topics as migration between different continents and within continents; the low birth-rate of primitive peoples; the high birth-rate which recently prevailed among civilised peoples, and the recent adoption by them of the small-family system. The factors, moreover, responsible for population growth in civilised countries are considered in terms of movements in death- and birth-rates and the grounds are explained for anticipating in northern and western Europe an impending decline in population. The salient facts of these arguments are epitomised in a valuable chart showing the net reproduction rates of 16 European countries and of the United States, Australia, and New Zealand between 1871 and 1934.

The author proceeds to consider the causes of the shrinkage of the family in civilised countries and the attempts which have been made to raise the birth-rate. The volume, while containing little original material, is so full of interesting figures and tables, selected from various sources, as to promise to become a handbook for students of population problems. Its potential value is in fact so great that it seems unfortunate that more trouble was not taken in its compilation. As he peruses the 22 chapters, the reader is troubled by the discontinuity of the exposition. Chapter 4 relates to migration movements; the subject of migration is then dropped for seven chapters and is taken up again in chapters 12 to 15. It is then again dropped and resumed in chapter 21. Chapter 9 deals with the small-family system and chapter 17 with the small-family problem, two topics which might have been taken together. The impression of disjointedness is sometimes so great that the reader may be led to feel that the book is a collection of essays written at different times, which it apparently is not. The last chapter contains a valuable analysis

of the relation between over-population—a topic which is interestingly and critically discussed—and the psychological origins of expansionist sentiments. Prof. Carr-Saunders concludes that it is the *belief* that over-population exists, or is threatened, rather than its actual presence or consequences, which is mainly responsible for generating expansionist sentiments. But the trend of this argument is difficult to follow by reason of the unnecessarily frequent use of oratio obliqua. On page 326, for instance, various statements are introduced as follows: "There is clear evidence that . . .," "Therefore it will probably be held that . . .," "On the other hand it is admitted that . . .," "Following up this line of thought it is sometimes said that . . .," "It will probably be held that . . ."

For some reason the book is rounded off with a note on over-population in which this topic (clearly dealt with in chapter 11) is subjected to a pseudo-algebraical elaboration which makes it almost unintelligible.

The Struggle for Population

By D. V. GLASS. Oxford: The Clarendon Press. 1936. Pp. 148. 6*s*.

HERE are presented the results of an investigation promoted by the Eugenics Society into the measures which have been taken in the various countries of the world to increase their birth-rates. The importance to England and Wales of these measures is brought home to the reader in the first chapter, wherein he is introduced to the various estimates which have been made by different authorities (Bowley, Leybourne, and Charles) of the future trend of our population. By a description of the method of calculating the net reproduction rate, and by a useful figure showing population pyramids for England and Wales in 1911 and 1931, Mr. Glass demonstrates how the mere consideration of the survival-rates for a short sequence of years can mislead us in forming an estimate of the reproductive power of a country. The fact is clearly brought home that though, by an excess of births over deaths, the population of a country may at a given moment still be increasing, it may nevertheless be predestined ultimately to diminish in the absence of an upward movement in fertility. In subsequent chapters, which were reviewed in our issue of August 22nd (p. 441), Mr. Glass analyses and assesses the measures taken by various European countries to arrest downward movements in fertility. The book, though a short one, contains a large volume of condensed, well-digested, and effectively presented facts. The six chapters (occupying 91 pages) which form the body of it have been made simple and self-contained, and can be readily understood by the ordinary reader. Into 53 pages of notes and appendices have been compressed much information, unobtainable in any other work in the English language, which will be found especially valuable by the expert.

Text-book of Pathology

Fourth edition. By Sir ROBERT MUIR, M.A., M.D., D.Sc., LL.D., F.R.S., Professor of Pathology, University of Glasgow; Pathologist to the Western Infirmary, Glasgow. London: Edward Arnold and Co. 1936. Pp. 994. 35*s*.

Sir Robert Muir's text-book is too well known to need any introduction from us, and a new edition is sure to be welcome. The present edition is of interest for its completion just before the author's relinquishment of the chair of pathology. While no fundamental alterations have been necessary, there are many minor changes, and no section has remained unchanged since 1933. To take but a few examples, additions to the text appear under the headings of Gierke's disease, lymphogranuloma inguinale, the relation of vitamin A to inflammatory processes, the use of supravital technique in the diagnosis of monocytic leukæmia, and granulosa-cell tumours of the ovary. These additions and 25 new illustrations have increased the total size of the book by only 37 pages. This has been accomplished by a judicious economy of words; there is scarcely a redundant sentence in the whole work. This book can be recommended for its sound teaching on all branches of pathology. The addition of a short bibliography would be a useful guide to students who wish to consult some of the numerous authors mentioned in the text.

Vitamins and other Dietary Essentials

Second edition. By W. R. AYKROYD, M.D., late Beit Memorial Research Fellow; Member of Health Section, League of Nations, 1931–35; Director of Nutrition Research, Indian Research Fund Association, 1935. London: William Heinemann (Medical Books) Ltd. 1936. Pp. 226. 7*s*. 6*d*.

Dr. Aykroyd's book on nutrition, first published in 1933, has not had time to become seriously out of date. The call for another edition has, however, provided the opportunity to bring it completely up to date, and this has been done at every point where valuable new information could be incorporated, and where new knowledge required that a point of view should be modified. A re-reading of this book confirms the impression that it is one of the best, if not the best, book on the subject that is not a scientific treatise. Any moderately well-educated person can understand it and even the expert dietitian or "nutritionist" can read with enjoyment familiar truths expounded with such lucidity and yet originality of outlook. The author has penetratingly clear vision, an admirable capacity for making well-weighed generalisations, and an undeviating idealism, all flavoured by a pretty and caustic wit.

A Manual of Practical Obstetrics

By O'DONEL BROWNE, M.B., B.Ch., F.R.C.P.I., M.C.O.G., Assistant Gynæcologist, Sir Patrick Dun's Hospital, Dublin; Assistant to the Professor of Midwifery, Trinity College, Dublin. Bristol: John Wright and Sons, Ltd.; London: Simpkin Marshall Ltd. 1936. Pp. 363. 20*s*.

THIS manual has been written for the student and general practitioner. The arrangement of the subject matter is unusual, special attention being drawn to normal labour, breech labour, puerperal sepsis, toxæmias, and the hæmorrhages of pregnancy, subjects which are apt to cause trouble to the student, both in his written papers in midwifery, and when he meets his examiner in the viva voce examination. The author has made full use of the pictorial method of teaching; the illustrations are sagittal sections, all drawn from the same side, and are very clear. This makes it easier for those who are meeting for the first time the mechanisms and manipulations of obstetrics. In the management of normal labour, it is stated that when the pains are regular and severe, the patient is to be put to bed and given morphine sulphate gr. ¼ or omnopon gr. ¼ hypodermically. We do not think this is good teaching for the student. The author admits that other forms of anæsthesia and analgesia may be used, but

it would, we think, have been better to recommend some milder drug, adding that some obstetricians give morphia or omnopon at this stage. The chapters on normal labour and the puerperium are well written. The methods described for the treatment of asphyxia neonatorum are sound, and possess definite advantages over the older methods of Schultz, Silvester, and others. The chapter on breech labour, normal and abnormal, is well planned and easily understood; and here the student will be particularly thankful for the wealth of illustrations. In dealing with the after-coming hydrocephalic head, one is rather surprised to read that all efforts should be made to deliver the child alive. At the end of the book is a chapter by Dr. C. L. McDonagh on the uses of radiology in obstetrics, whose value is enhanced by a collection of excellent radiograms. Dr. G. C. Dockeray contributes appendices on blood typing and the technique of the van den Bergh test.

Like most books of its nature, the views expressed here and there differ from the usually accepted ones. But the author displays throughout a sound understanding and the book may be recommended to all who are studying obstetrics.

Infant Speech

A Study of the Beginnings of Language. By M. M. LEWIS, M.A., Ph.D., Senior Lecturer in Education, University College, Nottingham. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1936. Pp. 335. 12*s.* 6*d.*

THERE are two recognised methods of study of the growth of children's speech: (1) observations of individual children as in the work of Preyer, Stern, and many others; (2) statistical study based on examinations of many children in particular respects, as in the work of Charlotte Bühler. The former method has recently been regarded with less favour, but the author of this book is a convinced advocate of the individual observational method with the proviso, however, that attention be given not merely to the sounds uttered and those to which the child responds, but also to the circumstances surrounding these events. The book is largely an analysis of the published records of former writers—Stern, Valentine, Guillaume, Hoyer, Deville, Preyer—and of observations made by the writer himself on one particular boy.

The main thesis of the writer, for which he accumulates the evidence skilfully, is that there is a definite continuity of development from the child's earliest cries and babblings to his acquirement of adult speech. Stern tended to treat as isolated topics the earliest stages of all and, indeed, has little to say of the first nine months. Bühler also envisaged the development of a child's speech as a series of sudden steps. On several other points also Dr. Lewis's views diverge from those of previous writers. He stresses the fact that a child's babblings, which he does not regard as mere random activities, not only include sounds associated with comfort but with discomfort—an observation parallel to that of Freud that a child's play often repeats experiences which were originally unpleasant. He accepts Freud's explanation as applying also to babbling, that the child thereby gains a mastery over the unpleasantness. In dealing with speech imitation he differs from the traditional opinion that this only commences in the latter part of the first year and produces evidence from several writers that there is an earlier stage of embryonic imitation in the first few months followed by its complete suspension due to increasing preoccupation with meaning and consequent decrease of automatic response. Dr. Lewis is not quite convincing on this point, and the very existence of an interval surely suggests some discontinuity. He criticises the tendency to regard a child's use of one term for different persons or things as indicative of abstraction and generalisation by pointing out that there is a similar wide use in the earliest months of simple sounds like "a" for different objects or situations. He analyses in detail the elisions and substitutions characteristic of early attempts at adult speech, emphasising the importance of affective and intonational factors from a very early stage in the evolution of child speech, and tracing the subordination of those factors to the objective standards imposed by social pressure.

The book is of value both for its analysis from a new point of view of old observations and for Dr. Lewis's original contributions. Its general thesis commands assent because of its inherent probability, although some of the evidence may not yet be completely satisfying. Appendices give in detail all the evidence which is analysed in the text.

NEW INVENTIONS

A NEW UTERINE DILATOR

EXPERIENCE in dilating the cervical canal in order to introduce radium into the uterine cavity in the treatment of carcinoma of the cervix has convinced me of the value of using channeled dilators—it is a not infrequent experience for quite forcible expulsion of pus, &c., to occur via the external opening, and to force possibly infected contents of the uterine cavity into the Fallopian tubes by the piston action of the ordinary dilator is obviously unwise when it is so easily avoidable. The principle is not novel (vide Blair Bell's "Text-book of Gynæcology"), but the ordinary variety of channeled dilator is not suited for this specific purpose.

The special features of the instruments here illustrated and described are their size, their curvature, and the exit of the channel along the side of the dilating portion. Only three sizes are used, the smallest being just bigger than the calibre of the uterine sound, while the largest is just bigger than that of the radium container to be inserted into the uterus. This ensures minimal dilatation, which is

considered of great importance in avoiding infection, and facilitates a precise introduction of the intrauterine radium. Treatments are all carried out with the patient in the knee-chest position at the Holt Radium Institute, and this necessitates a more accurate adaptation of the dilators to the uterine canal than is required in the usual lithotomy position. The curvature illustrated is found suitable in the greater number of cases, though another similar set with a lesser curve is also used.

Messrs. Down Bros., Ltd., 21, St. Thomas's-street, S.E.1, are the makers of the dilators.

T. F. TODD, M.S. Lond., F.R.C.S. Eng.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 12, 1936

THE IMPACT OF SCIENCE ON SOCIETY

A HUNDRED years ago the recently founded British Association for the Advancement of Science was defending Science with a capital S against the charge that it lured men too much from the study of the humanities, preoccupying them in its own narrow pursuits. This year and for some years past, as Sir JOSIAH STAMP points out in the opening of his presidential address,[1] Science makes its annual official appearance before the public with an air of diffidence and a hint of apprehension; it has worked such impetuous wonders in the daily life of man that it fears he may have been thrown off his balance, and by way of steadying him successive presidents have been pleading "for ethical values, for spiritual betterment, for right leisure, for moral advance, and for mental development." The engine wonders whether it is going too fast and advises the driver to have a care. Sir JOSIAH devotes most of his address to examining one aspect of the relation of Science to industrial and economic life—namely, the succession of sudden jerks or jars given to the social structure by the rapid application of new scientific inventions. This is the sense in which he defines "impact," and he illustrates it by describing how a new industrial process will quickly cause existing machinery, which is capital, to become obsolete before it is old, and how a new industry like artificial silk will encroach on the markets for an existing one and throw the cotton-workers into unemployment. Men set much store by their homes and are attached to the places and people they live among; they cannot be flung here and there over the country at industry's call like battalions in a battle. So nearly every innovation comes at the cost of obsolescence of capital and at least temporary unemployment of labour. It can be shown that if the innovations are a balanced combination of entirely new things and substitutes for old things, and—more important—if the total population is increasing, then these shocks resulting from the impacts of Science will be largely absorbed; but the peak of population in this country may be reached in 1942, after which there will be a fall affecting the younger age-groups first and most. How to adapt ourselves to these shocks will soon therefore become a serious sociological problem, and one worthy, Sir JOSIAH urges, of scientific study.

Though Medicine is one of the important channels through which scientific discoveries enter the life of the community, no examples are quoted of social dislocations attributable to sudden medical advances. On the contrary, the application of existing knowledge to problems of the community's health provides Sir JOSIAH with a long paragraph on "improvident tardiness." He points out that by altering diet "we could add two inches to the average stature and seven or eight pounds to the average weight of the general population besides enormously increasing their resistance to disease," and a part of that boon could be achieved even by just diverting expenditure from alcohol to milk. But we do not do these things, and the main reason he offers is that no one sees financial gain in urging us to do so. More economic shocks would no doubt be involved, and without the profit motive we prefer to avoid them. The remedy often offered is "the replacement of the present socially irresponsible financial control by socially responsible planning bodies," but Sir JOSIAH points out that most planning attempts hitherto made are mere rearrangements of existing facts and factors, and do not provide for possible future discoveries yet unknown; elasticity and adaptability are the qualities needed in the social organism, and how to achieve these and save our souls from dictatorship and ruling robots is a pretty problem. It may be argued that in these matters touching health Medicine has no special responsibility to the community beyond making the facts known; it is for the community to devise means of applying them, or create a school for studying those means. Within Medicine itself, however, there is often a long lag between the discovery of a new principle or method and its efficient application throughout the profession. Thirteen years after BANTING, there are still many doctors who do not understand how to use insulin. If we look forward in Medicine to advances in the coming 50 years as rapid as in the last, we should concern ourselves now with means of making them quickly available to every patient needing them—in other words, post-graduate medical education is a task to be undertaken on a big scale, not nibbled at by the schools or left to the writers of commercial advertisements. The doctor of the future should have both the opportunity, and the responsibility, of keeping his work up to date, and Medicine should be beyond the reproach of improvident tardiness.

The "impacts" of Science on society are but one feature of the broad human problem with which the last century or two of rapid advance in the physical sciences has confronted mankind. Sir JOSIAH abstains from generalising, but it is well to set the matter in perspective. Man's immensely increased power to make things and to cover distances, has given him a great appetite for consuming the things he makes and enjoying in one way or another his power over matter: the only way to greater satisfaction of that appetite is by mass production of goods and world-wide organisation of services. Science is therefore forcing man into increasingly complex large-scale organisation of his activities, and most of his present troubles are traceable to the difficulties inherent in that—to its conflict, in fact, with his individual or national desire for freedom of thought, freedom of action, and liberty to gratify himself at the expense of others. A miniature of this

[1] Delivered before the annual meeting of the British Association at Blackpool on Sept. 9th, 1936.

same conflict is approaching us in Medicine. The need for organisation on a larger scale is undeniable. Sir JOSIAH STAMP, for example, as a layman, observes that "half-verified theories run riot as medical fashions, to peter out gradually in disillusionment," because their rapid and efficient testing is not organised. But large-scale organisation involves some sacrifice of individual freedom of action, or inaction. Our task is to evolve a flexible and adaptive form of organisation, with a minimum of inertia, and to sacrifice for it only those parts of individual liberty which are directed to selfish or less worthy ends. The task of the nation, of mankind as a whole, might be stated in similar terms. Sir JOSIAH'S remedy for this state of affairs is a hair of the dog that bit us: "if the impact of Science brings certain evils they can only be cured by more Science. Ordered knowledge and principles are wanted at every point." The doctor, who knows the human animal individually pretty well, may just wonder if that is enough; human motives lie deep, and it may need a change of feeling and a redirection of purpose before the increase in knowledge and understanding can be fully made use of. But there is no doubt that the situation is serious, and not at all likely to drift to a satisfactory solution. Change seems inevitable, and we must study to master change and control it; that is the challenge before the Science of to-day and the Society of which it is a part.

SURGERY OF ŒSOPHAGEAL CANCER

RADICAL removal of carcinoma of the œsophagus was formerly dismissed as impossible. Œsophageal obstruction renders the patients unfit to stand a severe operation, and the situation of the tumour makes access to it extraordinarily difficult. Yet A. L. ABEL has maintained[1] that as many as a quarter of these cases are still potentially curable at the time of death, and accounts of successful removals suggest that surgeons are on the way to overcoming the technical difficulties. Hence it has become important to know in a given case whether or not the disease has spread beyond its primary site. ABEL'S opinion, quoted above, was based on post-mortem observation that the new growth often remains localised to the œsophagus. On the other hand there is a prevalent idea that cancer in this situation is apt to be particularly virulent. The proximity of any tumour to the mediastinal lymph glands, and especially to the tracheobronchial group, seems to hold a grave prognosis (O. W. ROBERTS).[2]

These considerations lend special interest to Mr. J. E. G. MCGIBBON'S inquiry[3] into the clinical manifestations of the disease. Taking a series of 100 cases he set himself to discover why radical surgical cure had not been attempted. In 65, he found, radiography and œsophagoscopy had revealed a local lesion so extensive that palliation was alone considered feasible, and in 29 there was already evidence of spread outside the œsophagus at the time when the patient first came under observation. The chief reason for the disease reaching this comparatively late stage before the surgeon has a chance to deal with it is the fact that the early symptoms are not recognised as serious, and MCGIBBON says that no abnormality of swallowing, nor any abnormal retrosternal, cervical, or epigastric sensation should be dismissed as neurotic without investigation. The average interval between the patient's recognition of his earliest symptoms and the surgeon's arrival at a definite diagnosis was between five and six months; and after the diagnosis had been made the patient had another five months to live. With so poor an outlook big risks are justified in treatment. But before doing extensive thoracotomy the surgeon must be satisfied that the disease has not spread beyond the œsophagus, for the thoracotomy may in itself prove fatal apart from resection. The growth may spread in one of four ways: (1) direct extension, (2) lymphatic permeation and embolism, (3) passage via the blood stream, (4) implantation. The last two are probably rare, though MCGIBBON is able to report two cases of implantation in the mouth, and one of endo-œsophageal implantation. Naturally it may be hard to decide, when pressure symptoms arise, whether they are due to direct or lymphatic extensions of the growth. In 5 of MCGIBBON'S 100 cases metastatic deposits produced a recognisable lump in the neck, and in 1 of them this glandular enlargement was the symptom that drew attention to the œsophageal growth. Involvement of the recurrent laryngeal nerve was shown by hoarseness or aphonia in 13 patients, when they first applied for treatment; hiccup, caused by phrenic nerve irritation, was the first symptom in another case. Severe pain in the back is particularly serious, for it suggests secondary deposits in the vertebræ, and in 4 of MCGIBBON'S patients such pain was the main complaint and dysphagia a minor consideration. Horner's syndrome as evidence of sympathetic nerve involvement has been reported, though not in this series. The thyroid gland was involved by direct extension in 1 case. Of the methods of examination, bronchoscopy should never be neglected, for it may reveal a lesion of the trachea or bronchus. The symptoms of perforation are severe paroxysms of coughing and fœtid expectoration and they call for immediate gastrostomy.

CARL EGGERS[4] points out that, as regards radical removal, growths at the lower end of the œsophagus should be more hopeful than growths higher up, because it is theoretically possible to operate entirely by the abdominal route and to re-establish the normal canal; and success has been reported using this method. E. G. MUIR, in a case lately described in our own columns,[5] used the combined thoracic and abdominal operation. In low œsophageal growths the question also arises whether to remove the whole œsophagus or to create a permanent œsophageal fistula. Both methods have on occasion proved effective. The function of swallowing is re-established by connecting the

[1] Œsophageal Obstruction, London, 1929, p. 168.
[2] Brit. Jour. Surg., 1930, xvii., 683.
[3] Ibid., July, 1936, p. 86.
[4] Surg., Gyn., and Obst., July, 1936, p. 54.
[5] THE LANCET, July 11th, 1936, p. 75.

cut end of the œsophagus to a gastrostomy tube. One of the greatest aids to combating shock, and at the same time to successful exposure of the œsophagus, has been preliminary artificial pneumothorax. Differential pressure anæsthesia is also used. In resection of the cervical œsophagus and pharynx, EGGERS is convinced that extensive operations are the best. By plastic operation it may be possible to use the skin of the neck to re-establish the continuity of the canal.

THE SHERLOCKIAN METHOD IN EPIDEMIOLOGY

"Beyond the obvious facts that he has at some time done manual labour, that he takes snuff, that he is a Freemason, that he has been in China, and that he has done a considerable amount of writing lately, I can deduce nothing else."

Those words must awake pleasant memories in a great number of readers. Few men have, directly and indirectly, contributed more to the stock of harmless pleasure than ARTHUR CONAN DOYLE. Whether he also taught us to reason more justly is not so clear, and many people have been jocose over Sherlock Holmes's reasoning. He was a good observer, but his deductions were a trifle risky and the Sherlockian method in medicine is not always a success. But in epidemiology Holmes's method is widely used, and how often has Holmes's renowned aphorism—when all other explanations have been excluded what remains, however improbable, must be the true explanation—been adopted. It *was* a little improbable that in the famous epidemic at Worthing 43 years ago watering the streets accounted for part of the outbreak. Still if all other possible explanations *had* been excluded—and certainly no others occur to us—the reasoning was sound.

Another inference redolent of Holmes was discussed by Dr. A. BRADFORD HILL and Dr. K. MITRA in our last issue. Women and children are larger consumers of milk than men; if in an epidemic of typhoid of uncertain origin the incidence is peculiarly heavy upon women and children, does that justify us in looking with particular suspicion upon the milk-supply? In the history of the subject there are splendid instances of a Holmes-like triumph. Thus in St. Marylebone in 1873 there was reason to suspect milk. In one family of 11 adults and 3 children, 2 children and only 1 adult were attacked. In another house a child and the servant who "was a great milk drinker" were the only victims. But then, in another mansion, the butler was attacked and one associates a butler with port but hardly milk. This seeming discrepancy, however, was a triumphant vindication. The butler, it appeared, had a soul above beer or even port; he was given beer money, but he drank—milk. So in time it became an accepted rule that a heavy incidence of disease upon women and children cast suspicion upon the milk-supply. Prof. R. M. F. PICKEN, however, had doubts and resorted to statistical inquiries which left him sceptical. Dr. HILL and Dr. MITRA have explored the statistical data very thoroughly and in an article which, we venture to suggest, proves that statistics are neither dull nor unintelligible, reach conclusions well worth pondering. They hold that current belief is in so far sound that a heavy incidence upon children and, among adults, a heavier incidence upon females than upon males, does justify some presumption that milk is at fault. They also hold that Prof. PICKEN's scepticism is justified in as much as the presumption has often been falsified. The moral of this is that the methods of Mr. Sherlock Holmes are not valueless, as some superior persons have held, nor are they the most important part of the equipment of an epidemiologist.

There is another moral: that the study of epidemiological problems has a good deal of the interest of detective tales. One has swift deductions (not always correct) and swift action (not always effective) based upon them. A sense of drama—sometimes terrible, as in the Eyam plague which the B.B.C. have found a suitable subject for the air—always sufficiently remote from day-to-day experience to take one out of oneself. That motive explains much of the popularity of detective tales. When epidemiology finds its Conan Doyle, imaginary M.O.H.'s may compete with imaginary police officers.

EFFICACY OF GARGLES

GARGLING is not a mere personal accomplishment: it is one of the most widely practised methods of preventive and curative medicine. Each night the sound of churning rises from a million throats, and their possessors go to bed conscious of a good deed well done. Yet the anatomical and physiological basis of the process is often questioned and apparently remains assailable to this day. Not only is it said that a gargle cannot touch the upper reaches of the nasopharynx, but it is even argued that contraction of the fauces prevents its getting to the tonsils or the posterior pharyngeal wall. Haase two years ago reached this very conclusion after radiographing the throats of those who had gargled with a thin suspension of barium sulphate; but as Dr. Julius Kaunitz, of New York, has pointed out,[1] "it does seem more practical to look directly into the throat than to take roentgenograms." Kaunitz himself found that after gargling with a thick suspension of bismuth the tonsils, posterior pharynx, and even the piriform recess are coated. This drew a statement from Dr. H. M. Walker,[2] of London, that some years ago he made a test with methylene-blue solution (after administration of atropine) and found that in none of ten patients did the gargle stain the tonsils or even the posterior part of the soft palate. Gargling, he concluded, was entirely useless. But so far the last word remains with Dr. Kaunitz[3] who says that he too originally tried methylene-blue but found it almost impossible, even with a cotton swab, to stain the normal mucous membrane of mouth and throat with this dye. It was this experience that led him to try a bismuth suspension.

Surely this is a controversy that could now be settled once and for all?

[1] Jour. Amer. Med. Assoc., 1936, cvi., 1679.
[2] Ibid., p. 2253.
[3] Ibid., August 15th, 1936, p. 520.

ANNOTATIONS

SHIPS AS HOUSES

DURING the lifetime of most of us, as Dr. J. Greenwood Wilson remarks on another page, the State has regarded the ship as a house for public health purposes, and the port sanitary authority at which the ship calls is responsible for hygiene at sea in the same way as the land sanitary authority is responsible for domestic hygiene. Nevertheless, while the standard of housing has steadily gone up, the standard of the forecastle is not much different from what it was 20 or 30 years ago, and Dr. W. F. Dearden is not alone in attributing the undue sickness among sailors to conditions mainly created by faulty situation and bad structural arrangement. Inspector Mackie, in Dr. C. F. White's recent report for the Port of London, says that British tramp ships still compare badly with ships of other nations in having an old type of forecastle, devoid of the facilities which would encourage a sanitary standard of living. It is now generally admitted that accommodation in the bows of a cargo ship is unsatisfactory. The crew should be in the poop or amidships. And it is easy to think that, if the medical care of seamen had been in the hands of the Ministry of Health instead of the Board of Trade, the improvement of ships and houses would have gone along parallel. Dr. White himself believes that things are improving. The shipping industry has been very sick and the convalescent must not be called upon for effort beyond his strength. It is not true that all owners are hard, all officers slack, and all sailors dirty. But how easy it is for a vicious circle to be started: poor accommodation in which only men who are indifferent to comfort and cleanliness will sail; disheartened officers who cease to endeavour to maintain decent conditions; owners who regard it as a waste of money to provide good quarters because they are not properly cared for by the occupants. If only one of the many recommendations made last year by the Association of Port Sanitary Authorities was accepted, things would soon be different. It is so modest a recommendation that it could be put into force at once. In plans for new ships let the accommodation to be provided for officers and crews be approved by a committee of which one or more members is a medical sanitarian with a special knowledge of marine hygiene. The recommendation was first made fourteen years ago, and its fulfilment must not tarry.

FLAVON AND CAPILLARY PERMEABILITY

THERE are a great many substances produced by the vegetable kingdom whose use to the plant we do not know, but which have been found indispensable to the discharge of some function, or the prevention of some pathological state, in the animal which eats them. Flavon is now added to the substances of this kind, for Szent-Györgyi and his colleagues at Szeged announce that flavon from plant tissues has a specific action in the human body in influencing the permeability of the walls of the blood-vessels.[1] [2] Some of the group of Hungarian workers had found that cases of "non-thrombocytopenic" purpura with increased permeability of the capillary walls to whole blood, and cases of septic infection with increased permeability of the vessel walls to plasma proteins, could be successfully treated with "vitapric" but not with pure ascorbic acid. Vitapric is an impure concentrate of ascorbic acid prepared from Hungarian red pepper. The inference seemed clear that the activity of this concentrate could not be due to ascorbic acid itself but must be due to an impurity. An attempt was made to concentrate an active fraction, and lemon juice was selected as starting material. After a series of chemical manipulations, including two precipitations with lead acetate and a final treatment with alcoholic baryta, a substance was obtained which appeared to be an almost pure flavon glucoside. It crystallised in pale yellow needles and was called citrin (citrus flavon), or, rather regrettably, vitamin P. It is not clear why it should be thought necessary to give a vitamin lettering to a substance whose position is known and to which a name can be given. Citrin proved able to decrease the permeability of the vascular wall, in cases of the type mentioned above, when injected in daily amounts of 40 mg., equivalent to 200 c.cm. of fresh lemon juice. Its action was not long maintained, and the permeability increased again quickly when the administration was discontinued; but its effect on the general condition, when administered continuously for a long time, remains to be determined. Cases of the right type for study are scarce, and no satisfactory animal test has yet been devised, so that progress in the field may be slow. Experiments to ascertain whether citrin has a specific action or whether other flavons are also effective have not given a definite result, but two such substances, quercitrin and rhamnetin, which were also tested, differed from citrin in causing fever and collapse when injected, and the result was thus obscured. The flavon, citrin, should be clearly distinguished in name from the other group of yellow dyes called flavins, and in function from the fat-soluble substance called vitamin T [3], which is supposed to have a favourable action in Werlhof's disease (thrombocytopenic purpura) by promoting thrombocytosis.

TOTAL COLOUR-BLINDNESS

CONGENITAL total colour-blindness is very rare; indeed Julia Bell, for her monograph on colour-blindness,[4] could find records of only 119 cases. In recording a further case in our present issue Dr. Macgilliyray and Dr. Macleod point out that all colours are differentiated by their light and shade only, other typical symptoms being amblyopia, photophobia, nystagmus, shortening of the red end of the visible spectrum, displacement of the brightest part of the spectrum from the yellow towards the green, and the frequent presence of central scotomata in the fields of vision. These cases therefore are essentially different from those of partial colour-blindness, which are common and in which most of the accompanying symptoms are absent. The ordinary colour-blind person may pass through life without knowing of his defect unless tested for certain special purposes. It would be almost impossible for the subject of total colour-blindness to do this. The pathology of the condition is unknown, and it is entirely a matter of speculation whether the abnormality is primarily an affection of the retina or of

[1] Rusznyák, St., and Szent-Györgyi, A.: Nature, 1936, cxxxviii., 27.
[2] Armentano, L., Bentsáth, A., Béres, T., Rusznyák, St., and Szent-Györgyi, A.: Deut. med. Woch., August 14th, 1936, p. 1325.
[3] Schiff, E., and Hirschberger, C.: Jahrb. f. Kinderheilk., 1936, cxlvi., 181, 191, 293.
[4] Eugenics Laboratory Memoirs, vol. ii., Part 2. London, 1926.

the brain. Miss Bell could find records of only two cases in which it was confined to one eye and these were doubtful. If they are excluded the theory that the primary fault lies in the structure of the foveal cones seems highly improbable. On the other hand, there is nothing but conjecture to support the theory that the fault lies in the visual centres in the brain. In some respects the total colour-blindness is analogous to albinism in which defects of the retinal structure have also been held responsible. In four cases of albinism in which a microscopical search has been made the fovea has been found to be structurally defective.

The occurrence of multiple cases in the same families places the hereditary nature of total colour-blindness beyond a doubt, but the mode of inheritance is unknown. Direct inheritance has not been noted; on the other hand, consanguinity in the parents of affected stocks has. Ordinary (partial) colour-blindness is evident in some of the pedigrees, but this condition is so common in the population at large that the connexion may be merely accidental.

AIR-BORNE THREADWORM INFECTION

In discussing whether ascaris infection may be air-borne we have pointed out [1] that the question needs an answer not only because of its importance in ascaris infection, but because its bearing on infection with *Cysticercus cellulosæ* and possibly with other parasites. Confirmation of the last suggestion has come from F. A. Lentze [2] working with *Enterobius vermicularis*, the common threadworm of man. As is well known, the female worm of this species creeps out of the anus for oviposition, and seems never to get back. While it is outside the anus its wrigglings cause irritation; the parts are scratched and in this way, it is generally believed, the eggs get under the finger nails, are carried by them to the mouth, and are swallowed. Prevention will then depend on keeping the hands away from the anus, particularly by making children wear closed combinations at night and by many scrupulous washings. But Lentze has been dissatisfied with this explanation, because when all these precautions were taken infection still went on. He noted too that for the worm's development from the egg it was necessary that it should pass six hours in an acid medium. That being so there is no room for the suggestion of G. Penso [3] that there is a stage in the worm's life in which it makes use of the mucosa of the large intestine as a sort of intermediate host, and Lentze was left with the two possibilities. Either the female worm at some time alters its instinct for passage down the bowel to one for passage up it to a level near the stomach where the reaction is acid and that after oviposition eggs stay there for six hours; or infection may be air-borne. The first alternative being biologically unlikely he tested the second. His earlier work had shown that threadworm eggs are able to pass through any material which is not closely woven, so he smeared a piece of nightshirt with eggs, put it in the upper 10 cm. of a wide cardboard cylinder 80 cm. long with open ends, shook this at the level of his head and then set it vertically on a glass plate, at the same time covering the upper end after taking away the cloth. The glass plates were replaced by fresh ones at frequent intervals, and eggs were first found on them two minutes after the infected cloth had been taken away; in addition Lentze found two eggs in the washings from his nose. Eggs had been carried by air for a distance of at least 70 cm. in conditions which had a physical likeness to those present when air currents are caused by restless movements under bedclothes. Lentze's suggestion is that eggs reaching the nose in this way are caught up there and pass to the stomach by being swallowed, or that the larva hatches out and passes actively down the œsophagus to the stomach. There is, however, a third possibility when a larva has hatched out in the air-passages—namely, that it, like other nematode larvæ, bores into the mucosa, enters a blood-vessel and gets carried by the circulatory and respiratory escalators to the œsophagus, to be then swallowed. Whether there is a passage of infected material from the respiratory mucosa to the stomach, and if so in what manner it takes place, is at present only reasonable conjecture; but what Lentze has shown is that threadworm eggs have in fact been carried to man by air. It becomes increasingly clear that the air is the vehicle concerned in the spread of certain worm infections, and even the helminthologist will be wise to become air-minded. As a practical point in treatment Lentze is satisfied that the usual anal ointments are soothing because they keep the wriggling worms from touching and tickling the skin, but that they actually make easier their escape from the bowel and the start of fresh infection.

[1] THE LANCET, 1935, ii., 313.
[2] Zent. f. Bakt. (Abt. I.), 1935, cxxxv., 156.
[3] Policlinico (Sez. Prat.), 1935, xlii., 1943, 1949.

PROGESTIN AND UTERINE CONTRACTIONS

The efficacy of corpus luteum extracts in cases of habitual abortion for which no organic cause can be found was discussed in these columns not long ago.[1] There seems little doubt that this condition is often due to abnormal irritability of the uterine muscle during the early months of pregnancy before the fœtus is securely anchored by a fully developed placenta. For purposes of treatment the natural product prepared from the corpora lutea of sows has been chiefly used, but Kane [2] now claims a higher proportion of successes with a synthetic preparation, possibly because this contains no œstrogenic material. He also reports abortions in subsequent pregnancies in which no corpus luteum was given—an observation showing the necessity for treatment in each succeeding pregnancy. But this, of course, is only what might be expected, since the administration of corpus luteum extract is merely a form of replacement therapy, and—apart from the possible influence of maternity in improving sexual function—has no permanent effect on the inherent defect, which is a relative lack or premature withdrawal of progestin during the early months of pregnancy. In his series of 36 successful cases 3 of the infants were born with some congenital abnormality, such as a spina bifida or an imperforate anus. It is improbable that such congenital defects are due to the influence of the artificially administered progestin, and they may rather be attributed to the fact that abortion is sometimes nature's method of eliminating the unfit. Several investigators have shown that a relatively high proportion of aborted fœtuses have anatomical abnormalities.

The tonic contraction and retraction of the involuting uterus is a mechanism that tends to disappear in multiparæ and give place to spasmodic, imbalanced, and painful uterine contractions known as after-pains. Lubin and Clarke,[3] in a series of

[1] THE LANCET, 1936, i., 728.
[2] Kane, H. F.: Amer. Jour. Obst. and Gyn., July, 1936, p. 110.
[3] Lubin, S., and Clarke, F. J.: Ibid., p. 134.

67 controlled cases, have found that the administration of 1 rabbit unit of progestin completely relieved these pains in 90 per cent. of cases, while in no other way interfering with the course of the puerperium. The injections were sometimes given as early as two hours after delivery.

Opinions still differ as to whether progestin inhibits spontaneous contraction of the uterine muscle during the second half of the menstrual cycle. H. Knaus, as the result of experiments on isolated uterine strips, and S. R. M. Reynolds, after studying the uterine motility of the unanæsthetised rabbit, are responsible for this theory, which is further supported by Knaus and by F. Wittelbeck, who showed that the human uterus loses its motility from the sixteenth day of the cycle to the onset of menstruation. Elden [4] refers to an interesting case of a human castrate who had previously suffered from dysmenorrhœa. This pain was reproduced after castration by administration of enough œstrin to lead to uterine hæmorrhage, though the same amount of œstrin followed by progestin did not cause pain. Elden and Wilson [5] have lately reported on 17 cases of dysmenorrhœa treated with progestin, in 8 of which complete relief was obtained. Control injections of sterilised oil were wholly ineffective. A more rigid selection of cases might have given even better results, for there is a group of cases with uterine hypoplasia which improves on œstrin rather than progestin therapy. Chassar Moir's observations on intra-uterine pressure in the human female are opposed to those of Knaus and Reynolds, and there is some doubt from his work whether spasmodic painful uterine contractions can be relieved unless the pain is purely psychogenic. It would be interesting to observe the effect of progestin on uterine contractions using Moir's intra-uterine bag actually during attacks of dysmenorrhœa. The psychological factor in dysmenorrhœa is a very important one and all clinical investigations should be controlled by the administration of injections of some inert oil.

THE PERMEABILITY OF THE SKIN

WHAT can or cannot pass through the skin is not merely a matter of academic interest; it is important from the points of view of toxicology, balneology, and industrial medicine. Prof. Emil Bürgi of Berne has been investigating [6] the skin's permeability to various substances. Penetration of the skin by liquids or solids that are subsequently excreted in the urine is easily measurable, but with gaseous or volatile substances the problem is more difficult. By means of a simple but ingenious apparatus consisting of a glass hemisphere closely applied and sealed to the skin with vaseline, wax, or gelatin, and furnished with two pipes through which the vessel can be filled or emptied at will, Bürgi has been able to measure indirectly but accurately the quantity of various gases absorbed by the skin. Thus he has found that, up to a point, the percentage absorption of CO_2 increases with the concentration of the gas in the apparatus, but beyond that point it diminishes. Similar results were obtained with H_2S except that concentrations of more than 0·2 per cent. of this gas were apt to provoke an inflammatory reaction in the skin, which diminished its permeability. Ammonia was found to penetrate the skin almost as easily as CO_2, but CO, being relatively insoluble in water, did not penetrate at all. The presence of mineral salts in solution, such as sodium chloride and sulphate, was found to hinder the absorption of CO_2. Nor was CO_2 from the blood excreted by the skin if the apparatus contained a 25 per cent. solution of common salt. Satisfied that the chlorides of sodium and calcium only penetrated the skin with difficulty, Dr. Bürgi, with the help of Dr. Beck, found that a 10 to 27 per cent. solution of sodium chloride or iodide was necessary before penetration could occur. A concentration of 10 per cent. of sodium chloride is often present in saline baths, but iodide baths never contain iodine in sufficient concentration for it to pass through a normal skin. The curative effect of CO_2 baths is due to their vasodilator action, and Bürgi concludes therefore that they are undesirable in heart disease, though he recommends their use in cases of arterial spasm and arterio-sclerosis. Sulphur baths, allowing the passage of H_2S through the skin, may be useful, he thinks, not only in chronic rheumatism, but also in diabetes and various skin diseases, such as furunculosis, psoriasis, acne, and eczema.

A second group of experiments, concerning more toxic substances, was carried out on rabbits. Attempts to produce chloroform narcosis in these animals through the shaved skin did not succeed, although the presence of chloroform was demonstrated in the expired air. Similar results were obtained with ether and carbon disulphide. Using tetrachlorethane, total anæsthesia was regularly induced in about 20–25 minutes, and it was found possible to kill rabbits by passing trichlorethane, hexachlorethane, and ethylene iodide through the skin. Numerous experiments convinced Bürgi that only those narcotic liquids that have a boiling-point higher than 80° C. can be made to penetrate the skin in sufficient quantity to bring about anæsthesia or death in the experimental animal. Those with a lower boiling-point are too rapidly eliminated in the breath ever to get into the blood or central nervous system. Many of these substances, notably tetrachlorethane, are used in industry so that these conclusions are of toxicological interest. Two other important substances to which the skin was found to be permeable were camphor and mercury. Grey ointment, which contains pure mercury, was found to penetrate more easily than white precipitate, which contains mercury in the form of Hg ($ClNH_2$). Corrosive sublimate in 1 in 1000 solution penetrated very little, and in 1 in 100 solution not at all.

BREAD

IT is not easy to give the subject of bread dispassionate consideration; which means looking at it with scientific objectiveness rather than the disinterestedness of anorexia. Tradition and personal tastes play their part, while various phases of propaganda have aroused distrust or enthusiasm according to their effect on the individual. The pre-war boom in "standard" bread was not founded wholly on fact, while the post-war "discovery" that brown bread promoted regular evacuation is linked in many minds with the idea that it prevents cancer. Lately a five-year plan has been launched to promote the sale of bread—without much hope, it may be noted, that the bread would be made to appeal on its own behalf by being more appetising. The higher price permitted and paid for brown bread has put its regular purchase beyond the means of the vast majority in the country; from their first crust the people are given white bread and at the age when they might make a choice are conditioned to accept

[4] Elden, C. A.: Endocrinol., 1936, xx., 47.
[5] Elden, C. A., and Wilson, K. M.: Amer. Jour. Obst. and Gyn., July, 1936, p. 91.
[6] Bruxelles-Médical, August 2nd, p. 1481.

white bread only. Very little brown bread is eaten for choice by the poor of this country, and that small amount principally because they believe it is good for them. The same reason presumably persuaded people formerly to eat white bread and explains why it has become whiter and whiter. It is a matter of history that when the bleaching of flour was introduced the substance known at the time to be destroyed in the process was carotine. The removal of this "impurity" was officially approved.

It is well, then, that with so much to mislead our thoughts on a staple article of diet there are recent and authentic pronouncements available. It is also well that one such, the report of the technical commission of the League of Nations Health Committee,[1] has gained the attention of at least one of our Members of Parliament; for it has moved Mr. A. P. Herbert to quote it and to put forward his own views on bread in last week's *Punch*. It must be admitted, however, that although Mr. Herbert professes himself in agreement with the technical commission his views are not exactly those set out in their report. He says that "bread, as most of us eat it is next door to poison" and a little later:—

"I find that white bread is no use, and brown bread is not much better, compared that is with such other energy-providers as potatoes, which have vitamins and minerals as well. And as a disciple of Dr. (W. H.) Hay I avoid the use of both white and brown with fish, meat and other proteins. For this is one of the fatal mixtures that make you fellows a mass of acidosis."

For fear that anyone else might take him literally let us be the first to do so. His squeamishness about taking bread with protein finds no support in the report, for it says that "the proteins of milk and egg . . . improve the utilisation of the protein contained in cereals." And then again, whatever other deficiencies white bread may have there is no gainsaying that it is full of carbohydrates which (whatever Dr. Hay may think) are alone able to prevent "acidosis." Wholemeal bread even comes in for praise in the report, which says that "attention should . . . be directed to the value of the lightly milled cereals as a further source of iron and vitamin B_1"; and also that the use of white flour "should be decreased and partial substitution by lightly milled cereals and especially by potatoes is recommended." At some points, then, Mr. Herbert's emphasis differs from that of the orthodox text, but his main conclusion is taken from the technical commission's report: we should eat more potatoes. A solemn thought for Mr. Punch.

HISTIDINE IN THE RELIEF OF PAIN IN PEPTIC ULCER

A COMPARATIVE study[2] of the action of histidine in gastric and duodenal ulcer has been undertaken by Dr. Etienne Feldheim who, in the course of about one year, has followed 32 cases, clinically and radiologically. Eighteen patients were given no other medicinal treatment, whereas 14 other patients were given histidine plus the conventional treatment with dieting, atropine, alkalis, &c. In the first group, the patients were allowed a mixed diet, the only restriction imposed on them being concerned with spices. A series of 20 intramuscular injections of a 4 per cent. solution of histidine was given, the patient receiving 5 c.cm. every day. The element of suggestion was eliminated as far as possible by not initiating the patients in what was proceeding. After this treatment had lasted only three or four days nearly all the patients no longer experienced pain—a result which was the more impressive in view of the histories of intense pain after meals for many months. This symptomatic achievement was in marked contrast to the radiological findings. Of the 18 patients in the first group, 3 faded prematurely out of sight. The remaining 15 were subjected to a radiological examination 40 days after the completion of the histidine course, and while 4 showed some improvement, as many as 11 showed no change whatever. Long enough time having been allowed for radiological signs of an ulcer to disappear in response to treatment, it would seem that the objectively demonstrable cure of gastro-duodenal ulceration is seldom obtainable by means of histidine alone. In the second group of patients there were four who were lost sight of, five who derived definite benefit from the combined treatment, and five whose response to it was negative. The conclusion which Dr. Feldheim draws from this study is that however dramatically effective histidine alone may be in relieving the pain of gastric and duodenal ulcer, its ability to cure the ulcer itself is limited. But in combination with the conventional treatment of gastro-duodenal ulceration, he regards histidine as useful, though no one yet knows how it acts, in relieving pain.

ARTHRITIS AND THE MIND

THE bacterial factor in arthritis, lucidly reconsidered by Dr. Patterson and Mr. Salt in our present issue, has had a large share of attention in the past few years. But there are other factors that must not be overlooked, and not the least of these the psychological or even psychogenic. In his report on chronic arthritis prepared for the Ministry of Health in 1928 Dr. Alison Glover pointed out that the onset is often traceable to mental stress, shock, anxiety, unhappiness, or financial worry; and most physicians who have much to do with patients suffering from rheumatism will agree that a first attack and also a relapse may coincide with a sudden crisis in the patient's affairs or the exacerbation of an emotional problem. In a suggestive comparison between the arthritic syndrome and schizophrenia Nissen and Spencer[1] point out that these two conditions almost never occur together; and indeed in a visit to a State hospital for mental diseases they could not find a single arthritic among 2200 patients. Their idea is that whereas the schizophrenic finds her escape through fantasy and dream life, the arthritic finds it through the somatic or physical; and it is important, they say, to realise that arthritis commands "protected dependence," though they do not emphasise this over and above other contributory factors such as the endocrine and metabolic. While it is difficult to think of so "objective" a disease as arthritis as having a purely psychic origin, it is probably everybody's experience that the prognosis, especially in chronic cases, depends, more than in most illnesses, on the presence or absence of a desire to get well. Any necessary psychotherapy, it is clear, is best applied in the early stages.

Dr. A. P. Gibbons has been elected master of the Society of Apothecaries, and Mr. Hugh Lett and Dr. Reginald Hayes wardens.

[1] See THE LANCET, August 1st, 1936, p. 282, and August 15th, p. 389.

[2] Presse Médicale, July 22nd, 1936, p. 1189.

[1] Nissen, H. A., and Spencer, K. A.: New Eng. Jour. Med., 1936, ccxiv., 576.

PROGNOSIS

A Series of Signed Articles contributed by invitation

CXIII.—PROGNOSIS OF CARCINOMA OF THE LUNG

PULMONARY carcinoma has become more frequent of recent years and in so doing it has not lost its reputation for being one of the most certainly fatal forms of malignant disease. Prognosis is therefore concerned first with the probable duration of life, and secondly with the degree to which pain and suffering may be relieved during the terminal stages.

In an analysis of 100 cases Maxwell and Nicholson [1] found the average duration of life to be 10·9 months from the onset of the first definite symptoms; 74 per cent. of their cases were dead within a year, and only one survived more than four years. The insistence on definite symptoms in this series of cases makes the duration of life shorter than with some other observers. It has been noted that the shorter the duration of symptoms before a diagnosis is made the shorter is the subsequent expectation of life; this observation points to variations in the malignancy of these tumours. Tuttle and Womack [2] state that in tumours originating in a major bronchus the average duration of life was 26·3 months, whereas in those situated in the more peripheral parts of the lung it was only 7·3 months. Part of this striking difference may be due to the fact that symptoms occur relatively early when the growth is situated so that it soon obstructs a main bronchus; but when the tumours were classified according to the degree of differentiation of their cells it was found that those situated in the main bronchi tended to be much more highly differentiated than those originating in minor bronchi where a more embryonic type preponderated. In Grade 1, in which the epithelial cells were well differentiated and showed attempts at bronchus formation, the average duration of life was 22·6 months. The round-celled carcinomata in which the cells resembled those of the basal layer in normal epithelium (Grade 3) gave a much worse prognosis, the duration of life being only 12·8 months. The intermediate Grade 2 gave an average life of 16 months.

Metastases are frequent, being observed in some 90 per cent. of autopsies. The mediastinal glands are most commonly involved, but spread to the abdominal organs or the brain occurs in a large proportion of cases. Naturally the detection of a secondary tumour in the brain or other vital organ adversely affects the prognosis.

Influence of Modern Methods of Treatment on Prognosis

IRRADIATION

(*a*) *X rays.*—Possibly on account of their derivation from the relatively radio-resistant bronchial cells, carcinomata of the lung only very rarely appear to give lasting beneficial results when treated by radiotherapy, and it is even doubtful whether life is prolonged in the majority of cases. This by no means indicates that X ray treatment is valueless; on the contrary, the majority of recent workers in this field are satisfied that the most distressing dyspnœa and symptoms due to suppuration caused by bronchial obstruction may frequently be relieved. When the relapse, which is almost inevitable, comes, the end is usually rapid and of a more merciful type. Craver [3] comments on the improved results which have followed recent modifications in technique. Whereas prior to 1933 43 per cent. showed palliation of symptoms, since that year this percentage has been raised to 71.

(*b*) *Radium.*—Radon tubes may be introduced by the bronchoscope into a bronchus obstructed by a neoplasm, or they may be inserted directly into a peripherally situated growth by thoracotomy. By this means a relatively strong dose of rays may be given to a limited area, and Tudor Edwards,[4] among others, has found this method much superior to X rays as a palliative measure in relieving the distressing atelectasis and sepsis due to bronchial obstruction. When introduced directly into an inoperable growth radium appears, in a large proportion of cases, to prolong life in addition to giving temporary relief from symptoms. Another palliative measure, which may be of use in the relief of dyspnœa due to glandular metastases, was originated by the late H. P. Nelson,[5] who implanted radon seeds directly through the tracheal and bronchial walls into the adjacent glands.

SURGICAL TREATMENT

(*a*) *Bronchoscopic.*—Some half-dozen cases are on record [6] in which bronchoscopic removal of a neoplasm has been performed; unfortunately this relatively minor operation is only practicable in rare cases of well-circumscribed or pedunculated growths. It is to be hoped that the increasing use of bronchoscopy for diagnostic purposes will result in the discovery more frequently of carcinomata at a stage early enough for local removal to be possible. Growths situated in or near the main bronchi tend to be of a relatively low grade of malignancy and thus suitable for surgical removal, but owing to their situation, if they cannot be attacked by the bronchoscopic method a total pneumonectomy is the only alternative giving any hope of a lasting result.

(*b*) *Lobectomy and pneumonectomy.*—The radical removal of a lobe or even of a whole lung would appear to be the brightest ray of hope in the otherwise gloomy outlook of pulmonary carcinoma. So great has been the advance of thoracic surgery in recent years, that these operations can now be performed on carefully selected cases with quite a low mortality-rate. In spite of these brilliant achievements radical surgical removal has, up to the present, only been found practicable in a very small percentage of cases. The difficulty of early diagnosis is the chief cause of the scarcity of operable cases; in a recent publication [7] it was found that in only one-third of the cases of pulmonary carcinoma coming to autopsy had a correct diagnosis been made during life. Diagnosis of this condition is undoubtedly

[1] Maxwell, J., and Nicholson, W. A.: A Clinical Study of Bronchial Carcinoma, Quart. Jour. Med., 1930, xxiv., 29.
[2] Tuttle, W. McC., and Womack, N. A.: Bronchiogenic Carcinoma—A Classification in Relation to Treatment and Prognosis, Jour. Thorac. Surg., 1934, iv., 125.
[3] Craver, L. F.: Carcinoma of the Lung, Diseases of the Respiratory Tract, W. B. Saunders and Co., Ltd., 1936.
[4] Edwards, A. Tudor: Malignant Disease of the Lung, Jour. Thorac. Surg., 1934, iv., 107.
[5] Nelson, H. P.: Irradiation of the Tracheobronchial Lymphatic Glands in the Treatment of Carcinoma of the Lung, THE LANCET, 1930, ii., 1118.
[6] Carlson, H. D., and Ballon, H. C.: Carcinoma of the Lung, Jour. Thorac. Surg., 1933, ii., 323.
[7] Husted, E., and Bulmann, G.: Hospitalstidende, April, 1936, p. 325.

very difficult, but it is reasonable to suppose that, with the treatment of early cases no longer absolutely hopeless, increasing efforts will be made by the profession in general to look out for the earliest suggestive signs, and if such are present not to delay the thorough investigation of the case. Even when diagnosed early there are several factors which are likely to keep the percentage of operable cases a small one; in the first place, the majority of patients are over 50 years of age, and few of these are good subjects for major thoracic surgery. Another consideration is that metastases often occur early, especially in those tumours which are situated at some distance from the hilum and which would, in other respects, be relatively suitable for surgical treatment. In other cases the tumour is so near the mediastinal region that complete removal is impossible.

Summary

1. Pulmonary carcinoma is one of the most fatal of neoplasms, the average duration of life being only about a year from the onset of definite symptoms.

2. X ray and radium treatment, although incapable, except in very rare cases, of arresting the progress of the disease, are frequently successful in relieving the distressing symptoms due to atelectasis and sepsis; although life may not be prolonged the mode of death is more merciful.

3. Radical surgical treatment is the one method which gives a fair prospect of permanent cure, but difficulties of diagnosis, early metastases, and the poor general condition of many patients restrict its scope to a small minority of cases.

ANDREW MORLAND, M.D., M.R.C.P.,
Physician, French Hospital; Tuberculosis Officer, University College Hospital.

SPECIAL ARTICLES

SLUM CLEARANCE AT SEA *

BY J. GREENWOOD WILSON, M.D., F.R.C.P. Lond.

MEDICAL OFFICER OF HEALTH, CITY AND PORT OF CARDIFF; LECTURER IN PREVENTIVE MEDICINE, WELSH NATIONAL SCHOOL OF MEDICINE; HON. SECRETARY OF THE ASSOCIATION OF PORT SANITARY AUTHORITIES OF THE BRITISH ISLES

UNDER Section 110 of the Public Health Act, 1875, a ship is regarded as a house and as such must be kept in a sanitary condition. The port sanitary authority, as the health authority concerned, is therefore under obligation to make sure that the accommodation provided is sanitary, and has most of the powers of a local authority to secure the remedy of nuisances. That was in 1875. But much water has run under the bridge since then. It is as though in 1875 the legislature, or that part of it which is progressively public health minded, turned aside for a moment from its preoccupation with schemes for the betterment of human environment ashore to cast a passing glance at the needs of the seafarer, upon whom so much of the prosperity and greatness of this country has depended. But what of the vast stream of public health legislation since 1875? How is this reflected in port sanitary administration? To better the environment of seafarers at sea, what is there to compare with the provisions of recent housing legislation? The dwellings of citizens ashore, if old, worn out, and unfit for human habitation, can be demolished individually or collectively. There must be no overcrowding, for there is a legal minimum of 50 sq. ft.—say, 400 cu. ft., per person over 10 years of age, excluding bathrooms, sculleries, cupboards, and chimney breasts. The limits, even for a seamen's lodging house, are 36 sq. ft. and 300 cu. ft. per person, but for crews' spaces they are no more than 15 sq. ft. and 120 cu. ft., *including* messrooms, bathrooms, and lavatories.

It is true, I suppose, that ships, when they have been worn out for some time, are sent at last to the shipbreakers' yard. Whether they would be so disposed of because they were unfit for human habitation is another matter. But what local authority ashore, having demolished houses that were old, worn out, and unfit for human habitation, would build new houses for rehousing the de-slummed or de-crowded dwellers reproducing all the disadvantages of the house that has been demolished? Yet that is precisely what British shipbuilders are doing, presumably with the approval of the Board of Trade. Dr. W. M. Frazer writes that:—

> During the past twelve months it was possible to examine and compare two vessels, both of recent construction, one British, the other foreign. The crews' quarters of both vessels amply conformed to the regulations laid down under the Merchant Shipping Act and this feature was the best that could be said of the British-owned vessel.

After describing in very favourable terms the crews' quarters of the foreign-owned vessel, in which he says the dominant note was one of comfort and cleanliness due to the care and imagination in planning and furnishing, Dr. Frazer goes on to describe vessel B, the British vessel, which was built and launched in 1935. Here, he says, "inspection of the crews' quarters was noteworthy only by the fact that the quarters so closely resembled those provided for the crew in British ships 20 to 30 years ago." Similar conclusions concerning the majority of British ships visiting Hull in recent years were reached by Dr. D. A. Cadman, Assistant Medical Officer of Health, Hull and Goole Port Sanitary Authority, in a paper read at Grimsby last year; and our experience at Cardiff is no better.

COMPULSORY STANDARDS

Minimum standards of accommodation for rehousing the working classes are laid down by the Ministry of Health. But the Government's interest in the environment of workers ashore does not end there. Hygienic working conditions in industry are safeguarded at least as to minimum requirements by the Home Office. It is apt to be forgotten that the seafarer's home is not only his castle (or, too often, *fo*'castle!), but also his workplace. In the Ministry of Health and Home Office you have strong medical departments. In the Government department which "looks after the life of poor Jack" you have no such medical representation. The second of 25 recommendations to improve the hygiene of crews' spaces in merchant ships made by the Association of Port Sanitary Authorities in 1935 was:—

> In plans of new ships, the accommodation proposed to be provided for officers and crews to be approved by a Committee, of which one, or more, member is a Medical Sanitarian with a special knowledge of marine hygiene.

The unbounded optimism and patience of the association are shown by the fact that a recommendation

* Substance of a paper read at the annual meeting of the Association at Newport (Mon.) on June 12th.

to the same effect was made by a special committee of the association in 1922—13 long years before. The trouble with these recommendations, the 22 in 1922 and the 25 in 1935, excellent as they are in every way, is that they are merely recommendations, and made by a body that has no power to enforce their execution. (Recently we have seen in another sphere an outstanding example of the ineffectiveness of recommendations made by a body that has no power to enforce them.)

The Shipping Federation Committee (1930) has also made a number of recommendations, some of them even agreeing with those of the Association of Port Sanitary Authorities, and the Board of Trade has issued certain instructions to surveyors (1923), but when these approach the ideals of the association we find that they assume the form of recommendations only. For example, surveyors *may* draw the attention of shipbuilders to the advantage of submitting a plan to the Board of Trade at an early date; and where the number of deck hands is over 12 and firemen over 18, it is *recommended* that separate sleeping accommodation for each watch be provided. The minimum requirements for healthy dwelling-houses are not recommended in the building by-laws of local authorities ashore—they must be carried out by law.

It is noteworthy that in foreign ships visiting British ports, which have been praised for the excellence of their crews' quarters, conditions are governed not by recommendations but by Government regulations. It remains for Great Britain, which has led the world in legislation enshrining the doctrine that bad environment must be prejudicial to health and therefore not to be tolerated, to fall behind other maritime nations in the application of that legislation for the welfare of its maritime population. It must be stressed that, in general, public health legislation against supposedly unhealthy environments has outstripped statistical evidence of the unhealthiness of those environments. Those who have had to go through the sometimes gruelling experience of a housing inquiry will understand my meaning. It is not always easy to make vital statistics support an allegation that a dwelling-house is unfit for human habitation. (I make emphatically one exception to that suggestion. I have never hesitated to adduce tuberculosis statistics in support of representations that the houses concerned are unfit for human habitation.)

TUBERCULOSIS IN SEAMEN

Pioneers in marine hygiene, like Dr. Dearden, Dr. Howard Jones, and Fleet-Surgeon Home, have found little difficulty in showing the relationship between unhealthy environment at sea and high tuberculosis-rates amongst seafarers. The Cardiff figures which I will deal with shortly were obtained by a different approach to the subject, but they support entirely the same conclusion—viz., that unhealthy environment at sea is predisposing to high disease figures amongst seamen. Yet despite the almost overwhelming statistical evidence behind this conclusion, and especially in relation to tuberculosis, we are still left with mere recommendations for the improvement of the sailor's environment unsupported by power of enforcement. In favour of improving crews' quarters we have a wealth of medical opinion based on statistical evidence but no power to act upon it.

In slum clearance ashore we have a contrary state of affairs. Here we have not, and do not need, the same wealth of medical statistical evidence. We need only to say that the house falls below the standards laid down in the Acts, and below that of average working-class houses in the district in freedom from dampness, adequate lighting, and ventilation, and minimum requirements as to sanitary conveniences, washing facilities, and arrangements for food storage.

In the Housing Act, 1935, a certain standard of overcrowding has been laid down. We do not have to say that because there are cases and deaths from tuberculosis in a certain overcrowded house, therefore that house is overcrowded beyond the minimum requirements for an uncrowded dwelling. The Act lays down the minimum standard and ends all discussion on the matter.

The merchant shipping act that lays down definite and adequate standards for human habitation in uncrowded conditions will be the seafarers' Magna Charta. The special circumstances of the shipping industry may force upon it the "improvement area" or "reconditioning" procedure, rather than the "clearance area" or "demolition" usually preferred for unfit dwellings ashore! But it is not enough, as in present merchant shipping acts, to say that a ship must be "properly" ventilated or "properly" lighted. The British cubic feet standard (120 cu. ft. for white men) is low compared to the best foreign standards—and remember that for dwellings ashore housing legislation has turned aside from the cubic feet standard to the floor-space standard.

The new act need not be complex, a simple amending act would suffice. All that it would need would be a single section empowering the Board of Trade to make regulations from time to time, with the approval of the Ministry of Health, for the construction and management of crews' quarters. The power to make regulations would be better than giving fixed standards in the principal act and would make for greater elasticity. New ideas that had been tried and proved could be incorporated in amending regulations.

I come now to the statistics. I said that the Cardiff approach had been different from that of pioneers in marine hygiene like Dearden, Howard Jones, and Home. These set out to collect figures showing disease incidence and mortality in seamen, and proved inter alia that a chief factor in maintaining a high rate of sickness and death amongst seamen is tuberculosis. In Wales, and particularly in Cardiff, there had been concern about the continuance of a relatively high mortality-rate from tuberculosis as compared with the average rate for England and Wales generally.

In 1924 the Cardiff public health department began to collate information regarding the occupational incidence of tuberculosis in Cardiff. In Tables I. and II. are shown the occupations of 3072 males and 2305 females who were notified or otherwise ascertained to be suffering from tuberculosis (all forms) during the 11 years 1924 to 1934.

The large number of cases that occurred amongst seamen is the most notable feature of the figures, which also show that tuberculosis affects all classes of the community. Some of the percentages and case-rates may appear to be high, but the figures, taken as a whole, suggest that there is no reason for believing that there is any industry in Cardiff, other than seafaring, which specially predisposes to tuberculosis.

Study of the tuberculosis death-rates per 1000 of the population for Cardiff during the years from 1894 to 1934 shows that the death-rate from tuberculosis of the respiratory system has declined in

TABLE I

Occupational Incidence of Tuberculosis in Males

Occupation.	Number and per cent.	Mean annual case-rate per 1000.
Professional	17 (0·55)	0·90
Insurance, commission, &c., agents	20 (0·65)	1·64
Commercial travellers	50 (1·63)	3·55
Clerks	237 (7·71)	3·76
Teachers and students	26 (0·85)	0·87
Shopkeepers and shop assistants	113 (3·68)	2·02
Bakers and confectioners	17 (0·55)	2·46
Butchers	21 (0·68)	2·56
Tailors	14 (0·46)	3·82
Printers	14 (0·46)	1·74
Factory workers	11 (0·36)	0·62
Laundry workers	7 (0·23)	0·61
Upholsterers	9 (0·29)	0·20
Warehousemen, &c.	41 (1·33)	2·25
Postmen	13 (0·42)	2·59
Messengers and porters	55 (1·79)	2·48
Railway workers	61 (1·98)	1·78
Engineers and fitters	53 (1·73)	2·00
Boilermakers, iron and steel-workers, &c.	29 (0·94)	0·78
Electricians	21 (0·68)	2·06
Building artisans	129 (4·20)	2·23
Seamen	**563 (18·33)*	*12·55*
Hairdressers	13 (0·42)	3·36
Colliers	13 (0·42)	3·13
Chauffeurs and motor drivers	35 (1·14)	1·36
Tram and 'bus conductors	23 (0·75)	5·08
Hauliers, vanmen, and hawkers	54 (1·76)	4·57
Gardeners	11 (0·36)	2·03
Labourers (various)	364 (11·85)	3·88
Miscellaneous	364 (11·85)	2·37
No occupation or unknown	175 (5·70)	2·71
Children of school age	303 (9·86)	1·41
„ under school age	196 (6·38)	2·01
All males	3072	2·60

* British, 176; foreign, 387.

that period from 1·62 in 1894 to 0·93 in 1934 and the death-rate from other forms of tuberculosis from 0·96 to 0·22. The death-rates from tuberculosis of the respiratory system and from other forms of tuberculosis have therefore fallen during the 41 years by 42·6 per cent. and 77·1 per cent. respectively. The death-rate from tuberculosis in Cardiff has not declined so rapidly nor to so low a level as

TABLE II

**Occupational Incidence of Tuberculosis in Females*

Occupation.	Number and per cent.	Mean annual case-rate per 1000.
Nurses	26 (1·13)	3·06
Teachers and students	26 (1·13)	0·78
Clerks and typists	108 (4·68)	2·74
Shopkeepers and shop assistants	123 (5·34)	2·60
Waitresses and barmaids	33 (1·43)	2·77
Laundry workers	24 (1·04)	2·96
Tailoresses	26 (1·13)	3·07
Factory workers	75 (3·25)	2·50
Packers	12 (0·52)	2·18
Domestic servants	247 (10·72)	3·22
Dressmakers and milliners	22 (0·95)	2·35
Housewives	850 (36·88)	1·36
Miscellaneous	60 (2·60)	2·13
No occupation or unknown	236 (10·24)	6·09
Children of school age	289 (12·54)	1·34
„ under school age	148 (6·42)	1·53
All females	2305	1·80

that for England and Wales as a whole and certain other large towns, but in fairness the death-rate for Cardiff should be compared, not with that for England and Wales and towns more favourably placed as far as the constitution of their populations is concerned, but with those for seaports in which the conditions unfavourable to a low tuberculosis death-rate are comparable.

In Table III. the death-rate in each of the years 1925–1934 from all forms of tuberculosis for Cardiff is compared with those for other seaports. The death-rate for England and Wales is included for comparison. It will be seen that, although the death-rate for Cardiff is higher than that for England

TABLE III

Death-rate per 1000 *from Tuberculosis (All Forms) at Seaports*

Seaport.	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
CARDIFF	1·53	1·28	1·54	1·21	1·34	1·15	1·29	1·26	1·26	1·15
Kingston-upon-Hull	1·27	1·20	1·24	1·22	1·27	1·28	1·36	1·01	1·09	1·01
Liverpool	1·51	1·49	1·38	1·39	1·49	1·43	1·35	1·32	1·34	1·15
Manchester	1·58	1·44	1·41	1·32	1·44	1·40	1·29	1·16	1·15	1·13
Middlesbrough	1·62	1·31	1·45	1·51	1·68	1·63	1·64	1·49	1·53	1·24
South Shields	1·78	1·78	1·56	2·13	1·86	1·66	1·70	1·92	1·84	1·75
England and Wales	1·03	0·96	0·97	0·93	0·96	0·90	0·90	0·84	0·82	0·76

and Wales, it does not compare unfavourably with that for the other seaport towns.

In Table IV. are shown the average yearly death-rates from all forms of tuberculosis for the municipal wards of Cardiff since they were constituted in November, 1922. The majority of seafarers live in Adamsdown.

TABLE IV

Average Death-rate per 1000 *of the Population from Tuberculosis (All Forms) for all the Municipal Wards of Cardiff During the* 12 *Years* 1923–34:—

Ward.	Death-rate.	Ward.	Death-rate.
Adamsdown	*3·49*	Canton	1·10
Central	1·77	Plasnewydd	1·09
South	1·64	Roath	1·09
Grangetown	1·42	Llandaff	1·01
Riverside	1·34	Gabalfa	0·98
Splott	1·26	Penylan	0·95
Cathays	1·13		

The attempt to explain the relatively high death-rate from tuberculosis in Cardiff by statistical methods leads to the conclusion that a principal factor in its maintenance is the high occupational incidence and mortality from tuberculosis amongst the seafarers, who constitute a section of Cardiff's population disproportionately large as compared with inland cities. The death-rate from tuberculosis in Cardiff is comparable with that of a number of other seaport towns.

It is argued that by analogy with experience ashore a high occupational incidence and mortality from tuberculosis amongst seafarers is favoured by unhygienic conditions of crews' spaces. It may be contended that similar conditions affect seamen in their own homes to an even greater degree, but this is not true of Cardiff, which, for a city of its size, has exceptionally few slums (even in the docks area) and which, though overcrowded, is not more so than many inland cities that have far lower tuberculosis death-rates.

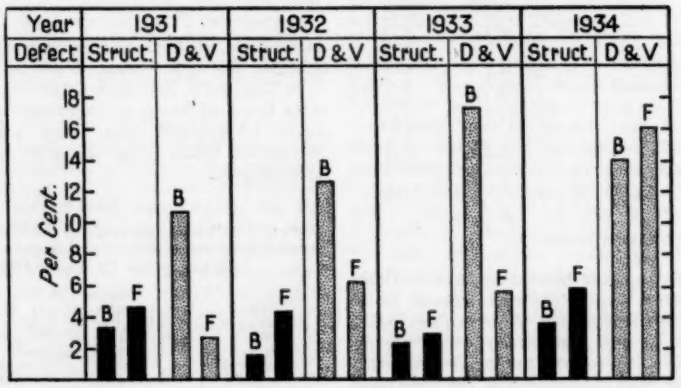
Dearden, writing in his annual report to the Manchester port sanitary authority for the year 1930, claimed that by analysing the total sickness returns which had been obtained from ships using the port during a period of ten years he had shown "that sailors suffered unduly from diseases due to or encouraged by those unhygienic conditions which are mainly created by faulty situation and bad structural arrangement." In his annual reports for

the years 1928–1930 he had compiled detailed tables showing the position and arrangement of crews' spaces in ships inspected at the port of Manchester, classified according to nationality and to period of building (before or after 1918) and giving in both these primary classifications the percentage of ships possessing such desirable facilities as wash basins, showers, baths, messrooms, hospitals, wash-houses, and the separate berth system. The Cardiff chart does not show these details of structure and equipment, but they indicate an increasing prevalence of "slum conditions" on ships visiting the port of Cardiff during the years 1931–34. (The 1935 figures just to hand show a slight improvement on foreign vessels, but almost none on British vessels.)

THE PROVISION OF BETTER QUARTERS

It is sometimes urged as a reason against providing better crews' quarters that the men cannot or will not show their appreciation by keeping them clean and tidy. In my view this contention is unnecessarily defeatist. It is not one that is adopted by local authorities ashore when they rehouse the inhabitants of insanitary or overcrowded dwellings. The policy there is to put them in hygienic and æsthetic surroundings in the anticipation that these will educate their new dwellers up to the new standards. In most modern housing estates abuse of the new and better environment is prevented by efficient estate management. Why should not abuse of improved crews' quarters be prevented by efficient management of these? I never can understand why it could not be made the duty of some ships' officers to insist on the crew keeping their quarters in a decent condition. There is no difficulty of this kind in the vessels of His Majesty's Navy.

SHIPPING CONDITIONS IN CARDIFF



Number of Vessels Inspected

	1931		1932		1933		1934	
	Struct.	D & V	Struct.	D & V	Struct.	D & V	Struct.	D & V
British	1358		1250		1235		1600	
Foreign	906		875		831		958	
Total	2264		2125		2066		2558	

Chart and table showing the proportion of British (B) and foreign (F) ships with structural defects (struct.) and dirty and verminous conditions (D. & V.).

I am also well aware that the economic condition of the British shipping industry at the present time is not such as to encourage "luxury building," except in vessels of the highest tonnage. But the importance of hygiene in industry ashore is gaining increasing recognition amongst industrialists themselves, and even in the depressed South Wales mining area new pit-head baths were opened only recently.

Further, the demand by sanitarians for improved hygiene in the shipping industry began long before economic depression overtook it. Dr. Collingridge, formerly M.O.H., Port of London, and later M.O.H., City of London, said in 1902 that the sanitary state of ships was fifty years behind that of the rest of the country. Dr. Howard Jones, formerly M.O.H. of Newport, showed in 1910 that we had lost our pride of place, and were no longer the pattern of sanitation at sea, for Norwegian ships had to have better conditions. Dr. Herbert Williams, in his annual report to the Port of London for 1911, wrote: "The conditions under which seamen in vessels live are particularly favourable for the dissemination of pulmonary tuberculosis, and it would seem that until the legislature takes some more practical interest in the welfare of seamen pulmonary tuberculosis will continue to be a cause of much mortality amongst this class of men." In 1911, at Brighton, the congress of the Royal Sanitary Institute passed this resolution:—

That, having regard to the unsatisfactory accommodation provided for the crew of many new vessels built in this country, the Council of the Royal Sanitary Institute be asked to approach the President of the Board of Trade with the view of securing a thorough revision of the requirements of the Board of Trade under the Merchant Shipping Acts, in respect to the living quarters for officers and men of all new vessels built under their supervision.

The council of the Royal Sanitary Institute decided that this resolution be forwarded to the Board of Trade. Dr. Howard Jones returned to the subject in no mean terms in 1913, 1915, 1920, and 1924. To Dr. Dearden's annual reports from 1928 onward I have already referred. He summarised his views in a paper called "Occupational Health Risks of Merchant Seamen," which was published in *Public Health*, June, 1929.

In 1926, the late Fleet-Surgeon W. E. Home gave an admirable survey of the position at that time with regard to the hygiene of merchant seamen. In concluding, he claimed the facts given in his paper as an ample justification of the action of the Royal Sanitary Institute in 1924 and 1925 in asking to have the medical care of seamen taken over by the Ministry of Health. By comparison, the recommendation of the Association of Port Sanitary Authorities that in plans of new ships the accommodation proposed to be provided for officers and crews should be approved by a committee of which one or more members is a medical sanitarian with a special knowledge of marine hygiene, is a modest one. Its adoption would go further than all the other 24 recommendations made by the Association in 1935 for the improvement of crews' quarters. It was made in essence so long

ago as 1922, but, like most of the other recommendations made within and without the Association, it still waits for fulfilment.

Grateful acknowledgments are due to Dr. E. H. Walker, successor of Dr. Dearden at Manchester, for sending the list of references bearing on the subject, and to my chief clerk and chief port sanitary inspector for the preparation of the Cardiff statistical matter.

BIBLIOGRAPHY

Assoc. of Port San. Authorities of the British Isles: Recommendations re Hygiene of Crews' Spaces in Merchant Ships, 1922 and 1935.
Board of Trade: Instructions as to Survey of Masters' and Crew Spaces, London, 1923.
Cadman, D. A.: Minutes of Assoc. of Port San. Authorities, 1931–35, p. 213.
Collingridge, W.: THE LANCET, 1894, i., 1111; Ann. Reps. to Port of London Authority, 1902.
Dearden, W. F.: Ann. Reps. Manchester Port San. Authorities, 1928–30.
Frazer, W. M.: Ann. Rep. to the Liverpool Port San. Authority, 1935.
Home, W. E.: Proc. Roy. Soc. Med., 1926, xix., 95; THE LANCET, 1930, i., 423.
Housing Acts, 1925, 1930, and 1935.
Howard-Jones, J.: Jour. Roy. San. Inst., 1915, xxxvi., No. 3; THE LANCET, 1913, ii., 857.
Manning Committee Report to the Shipping Federation Ltd., 1930.
Merchant Shipping Acts, 1894 and 1906.
Williams, H.: Ann. Rep. to Port of London Authority, 1911.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM A DOCTOR WITHOUT PATIENTS

THE medical faculty of the University of London is a remarkable body—I hope for its attainments, but the reference is to its constitution. Only a minority of the teachers are graduates of London. I find that of the physicians there are eight appointed teachers (professors or readers). One of these is a medical graduate of London. Of 83 recognised teachers, 30 are medical graduates of London. That the proportion is small is not surprising; London is a young university and probably only a minority at least of the senior teachers in all faculties were bred in London. But there are at least two other factors which keep the doctors apart from their non-medical colleagues. The first is that most of the medical schools are independent buildings, teachers and students do not have daily intercourse with non-medical colleagues. The other is that only a minority of medical students in London seek or obtain London degrees. An associated fact is the existence in London of three diploma-granting bodies all older than the university, all independent of it, while two of them grant diplomas which, if not more respected than the university's degrees, are, unlike them, necessary qualifications for the most desirable clinical posts in London.

The result is that both teachers and students of medicine tend to be segregated. Possibly too the medical faculty dwells a little too much upon its importance to the university and suggests a little too often that the London medical schools are the glory of the metropolis. I could write a glowing paragraph in support of that claim, but need not trouble; readers of THE LANCET know it by heart. It would be more in keeping with the holiday spirit to play devil's advocate and try to prove that the university faculty of medicine ought to be abolished. Well, first of all, there is a financial and administrative argument. The medical schools receive large grants through the university. Of course the Government grant would be smaller were there no medical schools, but why should the university have the bother of administration? Many London medical students (practically all the Oxford and Cambridge students) do not even seek a London degree. Of those who do seek one and stay the course as far as the second M.B. less than half reach medical graduation.

Then there is a sort of spiritual argument. In all the faculties except the medical, most of the recognised teachers are persons whose life work is bound up with some university. Their livelihood depends on teaching and research, university work is their primary interest. In the medical faculty that is not true. Many, probably a majority of recognised teachers in clinical subjects, are not primarily interested in teaching or research. The teaching is incidental to an office held for other reasons. They may be, and sometimes are, much better teachers than men in other faculties, but they are, after all, amateurs, their opposite numbers are professionals. Why should amateurs, whose success or failure in life depends hardly at all upon university success or failure, be put on the same footing as professionals?

* * *

In my opinion the most satisfactory retort is that a university needs amateurs. Simple inspection of the records shows that the educational antecedents of these amateurs are, at the least, as good as those of the professionals. They are educated people. In the development of so strange an institution as a London university must be, the active interest of *impartial*, educated persons who mix intimately with all classes of society should be of paramount importance. I think that to many people, to nearly all medical students, the *university* of London (as distinct from the schools) seems no more than a vast examining machine. I am not going to sneer at examinations or depreciate the skill and patience which the smooth running of the machinery of fair examinations require. But I would point out that even now the staff of the university are more than organisers of examinations. I could tell many a tale of the way in which men and women who wished to learn and had nobody to guide them have found in the university staff not bloodless examiners, not "clerks" lusting for completed forms, but friendly advisers. If the university is to rise to the height of its opportunities, work of that kind will grow until the university is not thought of as an examining machine at all, but as a great association of men and women, rich and poor, wise and simple, having a love of and finding pleasure in, to use the old words in an extended meaning, the humaner letters.

* * *

Liberally educated members of our profession are peculiarly fitted to take part in this reform or revolution. "The doctor," said Schopenhauer, "sees mankind in all its weakness; the lawyer in all its wickedness; the theologian in all its stupidity." Like most epigrams that is an exaggeration. The doctor also sees the heroic side of human nature; its patience and its fortitude. But it is surely true that an experiencing doctor does obtain more insight into the possibilities and practicabilities of human

nature than most men. Therefore he should be a good judge of educational ideals. But I do not think this is generally realised. We are too complaisant in accepting the advantages and disadvantages of the portentious rôle of an "expert." Provided we are allowed to lay down the law upon *our* subject, we are willing to be excluded from other activities. Some years ago a medical civil servant said to me bitterly, "The possession of a registrable medical diploma is regarded in the service as totally disqualifying the holder from the performance of any administrative act." How far a medical tendency to professional arrogance, to lay down the law upon matters respecting which the "law" was only ill-informed opinion, might be responsible for that attitude is an interesting question. After all, lawyers, even if they have inherited the earth, are not conspicuously meek.

In university matters our fault has been, I think, indifference to interests other than our own. We expect laymen to take an interest in our views on the medical curriculum, which we develop at length. We take very little interest in their views of it and none in the education of non-medicals. If we were a little less "expert" and a little more human in our relation with colleagues in an educational effort our real influence might be greater.

* * *

A peculiar worry of the professorial life is the making of appointments. In a fine passage in the "Life of Gladstone," Morley reflects on the papers stored in The Octagon, those dealing with persons: "In these time-worn papers successive generations of active men run chequered courses, group following group, names blazing into the fame of a day, then like the spangles of a rocket expiring. Men write accepting posts, all excitement, full of hope and assurance of good work, and then we remember how quickly clouds came and the office ended in failure and torment." The duties of professors, readers, and lecturers are not so important as those of cabinet ministers, governors, and judges, yet they have scope for failure and torment. No man can have sat for many years upon committees of selection or appointment without painful experience.

> "'Tis an awkward thing to play with souls,
> And matter enough to save one's own:"

Most of us can think of appointments eagerly accepted and unhesitatingly made which resulted in failure and unhappiness. We can only do our best. Many years ago I worked hard to secure a research appointment for my dearest friend. He was very happy in it, but it led him to his death. He died of an infection acquired in the course of an experimental study which no "amateur" would have had the opportunity to make. I have never believed that even a vice-chancellor was a locum tenens of the Almighty and am logically aware that my responsibility for my friend's death is neither more nor less than for the Great War. But whenever there is a difference of opinion about an appointment, or the applicant, perhaps, is uncertain whether he ought to take it and I am tempted to put in a word to encourage him, the ghost of a sneer emerges from my "unconscious" (if that is the right word). "Meddling *again*!" it says; "wasn't once enough?" That is, of course, just emotional nonsense; but it *is* a serious responsibility to encourage a young man to take up teaching and research. Thirty-two years ago this September I poured out my heart to a great leader of research, now dead. I have his answer before me and I copy some passages the spirit of which I at least try to convey to others.

"The man who lives by science will probably have to sacrifice his work at least now and then for the sake of advertisement, or for the profit of publishing the popular. This is true quite apart from the considerable number of men, who use science as a means of personal advances and do not follow it from a pure love of discovery. There always are certain branches which are popular and pay; naturally men are forced into these branches, whatever their especial aptitude and interest may be, and this introduces a want of singleness in the worker. Beyond this there is just as much jealousy and rivalry in the scientific world, just as much carpet-bagging and wire pulling as you would find—in another form it may be—among consultants, the leaders of a court of law, or in politics. Hence my advice to anybody in England would be don't go in for science unless you have private means and can pursue it purely for its own sake and disregard all other workers, at any rate so far as they may be competitors for scientific posts. Thus I cannot say to you, burn your boats. The men who are so keen on science that they will force their way through, researching and earning their bread at the same time, are not very many in number—the Faradays and Huxleys—and they would not be stopped by any statement of a prudent, commonplace character. Their determination to burn carries them through, and we smaller fry can safely say, 'Don't burn your boats' without a doubt that we shall not stop the man here and there, whose loss to science would be a catastrophe. I believe any man who has energy and character can succeed in any calling he chooses to follow, but he wants to be physically and mentally a giant so as not to be worn out by preliminary failures and disappointments."

That is as good advice to a young medical man with hankerings for research in 1936 as it was in 1904. Perhaps it is even more needed because the temptations are greater. There must be at least twenty times as many whole-time fellowships and grants available for newly qualified medical men and women now as at the beginning of the century. To start as a researcher is not such an unmistakable burning of one's boats as thirty years ago. That is, no doubt, for the good of humanity. A *few* men and women who would have been lost to science are saved. But there is another side to it. It is quite easy to spoil what might have been a good doctor without producing a tolerable researcher. It is much easier to acquire a habit of superiority as a "scientist" and to sneer at the sciolism of mere doctors than to contribute anything of importance to science, pure or applied. Failing in research work is not really a good introduction to medical practice.

* * *

Perhaps a year in general practice would be a better preparation for the life of research *or* of treating patients than any other. Most theological scholars had their titles for orders from parochial work, and I suppose most law professors have read in chambers. If one is to devote oneself to the science of medicine it is well to know something of the art of medicine. But it does not follow that a good artist will be a good scientist. In modern English universities whole-time professors in the faculties of arts and science are paid about half as much as whole-time clinical professors and about two-thirds as much as non-clinical professors in the faculty of medicine. Were a member of our faculty so devoid of the trade-union spirit as to ask why the academic market value of a professor of medicine is twice that of a professor of mathematics or physics he would probably be told that good clinicians earn in "Harley Street" incomes much larger than any salaries attached to whole-time clinical chairs, and that the chairs could not be filled by competent men if the stipends were

those of mathematicians or physicists. The assumption is that those who are skilled and esteemed as artists are, on that account, likely to be good scientists. I wonder whether the assumption is just. I suppose the head master of a public school has a much larger income than any professor of Greek or mathematics, but professors of Greek and mathematics are seldom recruited from young head masters. Moderately successful barristers earn much larger incomes than academic law professors. There is no movement to raise the stipends of chairs of Greek or jurisprudence in order to tempt the house masters and practising lawyers. Possibly the qualities of a good teacher and investigator are not those which have a high commercial value. Perhaps St. Peter's rebuke of Dr. Simon Magus—although a little harsh, because Simon was apparently only offering to endow a chair—had a kernel of good sense. It is an undoubted evil that men on an ostensible footing of equality in a university should be very unequally remunerated. It leads to a host of Freudian rationalisations and jealousies. I suppose the truth is that we English, in spite of the multiplication of universities and chairs, do not really take professors much more seriously than in the days when Matthew Arnold so strongly protested against being described as Professor Matthew Arnold. We cannot really believe that any sensible man would actually sacrifice income for the joy of being a professor. Whole-time clinical professors are a relatively new departure in England; it will be interesting to see whether in a couple of generations their intellectual and pedagogic standard is really higher than that of the lower paid professors of "pure" science.

PANEL AND CONTRACT PRACTICE

THE BURDEN OF SICKNESS UPON INDUSTRY

IT is a remarkable fact that although this country, under the leadership of William Farr, long held a premier position in the development of vital statistics it has now in some respects fallen behind other countries. For example, since the age of the mother is not required on the birth certificate it is difficult to apply the simple and illuminating methods devised by Dr. Kuczynski for the measurement of population growth. Our most serious statistical deficiency, however, is the lack of an adequate body of information on morbidity, the prevalence of non-fatal sickness, particularly in relation to occupation, age, sex, and geographical distribution. On this important subject surprisingly little has emanated from the national health insurance system, which has now been in operation for nearly a quarter of a century, but about five years ago the Department of Health for Scotland began to issue a valuable series of annual reports on incapacitating sickness in the Scottish insured population, the fifth of which, relating to the year ended June 30th, 1935, has just been published (H.M. Stationery Office. 9*d*.).

The population covered by the report consisted of 1,689,468 persons, of whom 1,137,809 were males, 486,748 unmarried, and 64,911 married females. During the year these persons suffered from illnesses which caused in the aggregate 18,578,578 days of incapacity for work, equivalent to 11 days incapacitating sickness per person, or to the continuous incapacity of some 50,000 persons over the whole 12 months. These figures were in excess of those of any of the preceding four years, the excess over the year immediately preceding being attributed in part to the outbreak of influenza during the early months of 1935. As in previous years, the number of days of sickness per person varied according to sex, and, in women, to marital condition; for men it was 10·11, for unmarried women, 11·66, and for married women, 21·16. There was a similar variation in the average duration of incapacity, which for men was 45·39 days, for unmarried women 48·50 days, and for married women 55·98 days. As might be expected, the average duration of incapacity increased with the age of the patient, and the same was true of the time lost through sickness, except that among married women the period of incapacity per person was higher at ages under 25 than at any other age up to 55. The chief cause of sickness was the group of respiratory diseases (including influenza) which accounted for 42 per cent. of the total number of cases and 21 per cent. of the days of sickness. Then came diseases affecting the organs of locomotion, chiefly acute and chronic rheumatic conditions, which accounted for 11 per cent. of cases and 12 per cent. of total days, digestive diseases, accidents, and skin conditions. The incidence of sickness varied considerably among the different areas, the variations depending upon the nature of the occupations in which the insured persons were employed; the incidence was especially heavy in the coal-mining areas.

THE VOLUME OF INCAPACITY

The report begins with a general review of the information made available in the five annual reports that have now been published. It appears that on average 22·2 per cent. of the total number of insured persons in Scotland are every year rendered incapable of work by sickness, and that the average duration of a period of incapacity is 46–47 days. The incidence of sickness upon our wage-earners is clearly a heavy burden upon industry, causing a serious reduction in the nation's productive capacity. And these reports, which relate only to patients medically certified as incapable of work, do not tell the whole story; for there is a considerable volume of sickness which though not certifiable yet impairs in varying degree the efficiency of the worker for his job. The statistics, as the report points out, "indicate a level of health and physical fitness very much below not only what should but what might be." In spite of the progress we have made in public health, which is reflected in the remarkable reduction of the death-rate and the infant mortality-rate during the present century, there is ample evidence in this report that there is still much to be done to secure that fuller control of disease which has been made possible by recent advances in the science and art of medicine. Apart from what is required in environmental and industrial hygiene, there is particular need for the strengthening of the insurance medical service by the provision of the specialist and ancillary services recommended ten years ago by the Royal Commission on National Health Insurance. It can hardly be doubted that if the insurance practitioners were thus reinforced many difficult problems of prolonged incapacity would be solved and many working days restored to industry. The need for such a development is specifically mentioned in the report in connexion with an investigation made by one of the regional medical officers into a series of diabetic cases under insulin treatment, which showed a lack of adequate supervision of

such cases both with regard to the dosage of insulin and the regulation of the diet; it is thought that "a similar situation probably obtains in the case of pernicious anæmia, gastric and duodenal ulcer." Further investigations of this kind might usefully be made by the regional medical staff, even if it involved devoting less time to the inspection of insurance medical records.

CHANGING AGE-DISTRIBUTION

One of the most disquieting facts that emerge from the Scottish reports is the gradual ageing of the insured population. During the five years covered by the series there has been a considerable diminution in the proportion of the younger workers, and with this is associated an increase of chronic sickness causing long-term incapacities. The changed age-distribution of the workers is of course due to the rapid decline of the birth-rate, which has now reached a figure less than one-half of what it was when the century began. Unfortunately this factor in the production of incapacity for work is bound to increase in intensity as time goes on. Incapacitating sickness has now become an industrial problem of the first magnitude and calls for far more consideration than it has yet received. The solution we venture to suggest may best be sought not in criticisms of the medical profession or admonitions to insurance practitioners to be more careful in the issue of incapacity certificates, but in the patient and detailed investigation, somewhat on the lines of the Scottish reports, of the causes of incapacity and the means by which they may most effectively be mitigated if not removed.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE CENSUS

THE Preliminary Report of the Census of Population of the Irish Free State, taken on the night April 26th–27th, 1936, has been issued with commendable promptness. The population enumerated was 2,965,854 as compared with 2,971,992 in 1926, representing a decrease of 6138, or 0·2 per cent. Both absolutely and relatively the decrease is the smallest since the diminution of the population began in the decade 1841–51. For the first time since that period there has been an increase in the male population, which this year was 1,518,807, compared with 1,506,889 in 1926, an increase of 11,918, or 0·8 per cent. The number of females this year was 1,447,047, compared with 1,465,103 in 1926, a decrease of 18,056, or 1·2 per cent. While the total population has remained almost stationary the distribution among the general areas has shown much change. The province of Leinster has shown an increase of 6·1 per cent., while the provinces of Munster and Connaught and the part province of Ulster have shown decreases of 2·9, 5·1, and 6·7 per cent. respectively. The increase in the population of Leinster is accounted for mainly by the increased population of the county and city of Dublin, although there have also been increases in the counties of Louth and Wicklow. The population of the city of Dublin has increased by 15·7 per cent., that of Cork by 2·8 per cent., of Limerick by 4·9 per cent., of Waterford by 4·9 per cent., of Drogheda by 14 per cent., of Sligo by 9·3 per cent., and of Galway by the remarkable figure of 28·5 per cent. The great majority of the towns and villages show increases of population, while the rural areas all show decreases. The outstanding fact as regards distribution is, then, that there has been a shifting of population from the country to the towns, more marked than at any previous period.

The fact that there has been a decrease of population has given rise to surprise and comment, as it was believed that the great decrease of emigration to the United States in recent years would have led to an increase of population at home. The virtual stoppage of emigration to the States, however, appears to have been followed by an increase of emigration to other countries, mainly Great Britain. This emigration to Great Britain which affects females more than males, probably accounts for the low proportion of females to males in the Irish Free State.

PARIS

(FROM OUR OWN CORRESPONDENT)

PUBLIC *versus* PRIVATE HOSPITALS

THE unequal contest waged between the public and the private hospitals has recently been marked by an illuminating incident. The executive committee of the public hospital of Sables-d'Olonne has ruled that the surgeons who are henceforth employed by this institution must undertake not to operate in other hospitals or nursing-homes in the town. This ruling was evidently inspired by the fear that young surgeons with more energy than wealth might supplement their official incomes by unofficial activities calculated to compromise the successful working of the paying wards of this public hospital. Already the private hospitals have been handicapped by rates and taxes, interest on loans, and all the other charges that are only too familiar to those who engage on independent commercial enterprises. The public hospital, on the other hand, enjoys legacies, freedom from taxation, and subsidies from all sorts of quarters, among which may be included a by no means negligible share in the *pari mutuel*—the gambling on races hallowed by the patronage of the State. In spite of all these exemptions and revenues, the executives of many public hospitals have been eager to exploit the opportunities afforded by the paying patient for swelling their incomes. It is a natural and even laudable ambition. And there will be many a dry eye over the passing of some of the most mercenarily conducted nursing-homes. But many a private hospital in France has done yeoman service, and there are misgivings in certain quarters over the prospect of hospital services run exclusively by State and municipality paid servants.

CONTROL OF THE SALE OF DRUGS

The uncontrolled sale of drugs has at last become such a nuisance, if not an actual danger, to the public that a Bill has been drafted to deal with it. It was passed by the Senate on August 10th. According to one paragraph, the sale of curative or preventive medicaments to the public is to be strictly forbidden in all shops which are not licensed pharmacies. The same prohibition applies to the sale of medicinal plants which the public can henceforth not buy of other salesmen than chemists and herbalists. There are also provisions prohibiting the house-to-house traffic in drugs. It will be curious to see how the public will respond. Auto-prescribing is so delightfully fascinating that any measure intended to curb it must surely evoke an almost covenanting spirit of revolt.

MEDICAL EXAMINATION OF CANDIDATES FOR NATURALISATION

Dr. F. Jayle, the gynæcologist well known in French medico-political circles, has just presented to

the Academy of Medicine a short report on the need for examining medically all candidates for French citizenship. At present there are some 140,000 such candidates, and if to them be added their wives and children, there may well be some 300,000 persons concerned. Dr. Jayle's report was referred back to a commission on which Profs. Sergent, Renault, and Tanon sit.

BRITISH POSTGRADUATE MEDICAL SCHOOL

COURSES OF LECTURES FOR 1936–37

THE teaching activities of the British Postgraduate Medical School have not been suspended during the summer months, but they have consisted mainly in the provision of facilities for students to take part, under supervision, in the routine work of all departments of a large hospital, supplemented by more or less informal demonstrations. The first two-weeks' "refresher" course for practitioners this autumn, conducted on the same lines as those previously held, will begin on Sept. 21st, and another such course will be held in October–November, starting on Oct. 25th. What is regarded as the most important function of the school, however, is the opportunity provided for doctors from all parts of the world who want to extend their knowledge in medicine, surgery, or gynæcology and obstetrics, and for students of pathology who desire to do advanced work. Several post-graduates of this type are enrolled for various periods of study; these students are provided with ample material and encouraged to work at it under expert guidance.

For the academic year 1936–37 each of the four departments of the British Postgraduate Medical School has arranged special courses of lectures and lecture-demonstrations on diverse aspects of medical practice and medical research. They are designed primarily for the students working in the school, but a certain amount of accommodation will be available free for other medical men and women who make application to the dean.

The authorities of the school deserve congratulation for their selection of subjects and personnel, especially perhaps in the group of lectures on modern pathological advances, which should prove attractive to all those interested in the newer developments of medical research.

Department of Medicine

Oct. 6th to Nov. 10th	Psychological Medicine in Practice.*	Dr. H. Yellowlees.
Nov. 16th to Dec. 14th	Diabetes and Diseases of Pancreas.†	Dr. R. D. Lawrence
Jan. 11th to Feb. 15th	Nephritis and Allied Conditions.†	Dr. Hugh MacLean.
Feb. 23rd to March 23rd	Endocrine Diseases and Disturbances.*	Dr. H. Gardiner-Hill.
April 5th to May 10th	Arthritis.†	Dr. C. W. Buckley.
May 25th to June 29th	Occupational Diseases.*	Dr. Donald Hunter.

* Tuesdays at 4.30 P.M. † Mondays at 2.30 P.M.

Department of Surgery

Oct. 1st to Nov. 6th	Surgery of Nervous System.‡	Mr. Geoffrey Jefferson.
Nov. 13th to 27th	Acute Surgical Infections of Bone.§	Prof. John Fraser.
Dec. 4th to 18th	Acute Surgical Infections, other than Bone.§	Prof. Seymour Barling.
Jan. 8th to Feb. 5th	Surgical Diseases of the Rectum.§	Mr. W. B. Gabriel.
Feb. 12th to March 19th	Fractures.§	Prof. E. Hey Groves.
March 31st to May 5th	Surgery of the Chest.‖	Mr. J. E. H. Roberts.
May 14th to June 18th	Diseases of the Breast.§	Mr. Russell Howard.

‡ The first four of these lectures will be held on Thursdays at 2.30 P.M., and the last two on Fridays at 2.30 P.M.
§ Fridays at 2.30 P.M. ‖ Wednesdays at 4 P.M.

Department of Obstetrics and Gynæcology

Oct. 8th to 29th	Antenatal Care.—Radiology in Obstetrics.—Puerperal Sepsis.—Obstetric Emergencies.	Prof. F. J. Browne.—Dr. R. E. Roberts.—Dr. R. M. Fry.—Dr. W. H. F. Oxley.
Nov. 5th to Dec. 3rd	Abortion.—Hæmorrhage of Late Pregnancy.—Toxæmias of Pregnancy.	Mr. Aleck Bourne.—Mr. Eardley Holland.—Mr. G. F. Gibberd.
Dec. 10th and 17th	Disproportion and Difficult Labour.	Prof. J. M. Munro Kerr.
Jan. 7th and 14th	Cæsarean Section.—Anæsthesia and Analgesia.	Mr. J. Bright Banister.—Prof. Amy Fleming.
Feb. 18th and 25th	The Female Sex Hormones.—Dysmenorrhœa.	Prof. E. C. Dodds.—Mr. Charles D. Read.
March 4th to 25th	Malignant Neoplasms of Uterus.—Sterility.—Hormone Therapy in Gynæcology.—Genital Prolapse.	Prof. Gilbert Strachan.—Mr. V. B. Green-Armytage.—Dr. P. M. F. Bishop.—Prof. Daniel Dougal.
April 1st to 29th	Neoplasms of the Ovary.—Benign Neoplasms of Uterus.—Irregular Uterine Hæmorrhage.—Radiation Therapy in Gynæcology.—Gonorrhœa in Women.	Prof. James Hendry.—Mr. Clifford White.—Mr. Wilfred Shaw.—Mr. Malcolm Donaldson.—Col. L. W. Harrison.
May 6th and 13th	Salpingitis.—Birth Control.	Mr. Aleck Bourne.—Dr. Helena Wright.

All these lectures will be held on Thursdays at 3.30 P.M.

Department of Pathology

Oct. 7th to 28th	Microscopy.	Mr. J. E. Barnard, F.R.S.
Nov. 4th to Dec. 9th	Virus Diseases.	Prof. S. P. Bedson, F.R.S.
Jan. 13th to Feb. 17th	Experimental Endocrinology.	Mr. A. S. Parkes, F.R.S.
March 3rd to 17th	Tissue Culture.	Miss Honor Fell, Ph.D.
April 7th to May 12th	Experimental Cancer Research.	Dr. W. E. Gye.
June 2nd to 16th	Experimental Epidemiology.	Prof. Major Greenwood, F.R.S.

All these lectures will be given on Wednesdays at 4.30 P.M.

PUBLIC HEALTH

Typhoid after Camping

FOURTEEN members of a party of 40 girl guides who had been camping from July 23rd to August 8th near Brighton fell ill of typhoid fever after their return to Bermondsey. Two of their number have died—namely, the conductor, a woman of 42, and a girl of 13. The onset in the first case was on August 8th, and in the last on the 31st. Dr. D. M. Connan tells us that in three of the 14 cases there is some doubt about the diagnosis, and that one of the girls who assisted in the preparation of the food for the party is at present in hospital for investigation as a possible carrier. No source of infection has been discovered in Bermondsey. All the other patients in hospital are making good progress. We learn from Dr. Duncan Forbes, medical officer of health for Brighton, that 20 or more of the guides slept on straw-filled mattresses in the basement of the Robertson Memorial Hall, others who slept at a private house coming to the hall for their daily provisions. There was only one sink with water laid on and the conditions under which the food was prepared were, in Dr. Forbes's opinion, such as to make the presence of a carrier particularly dangerous. None of the girls appears to have visited Bournemouth, and the time-table of onset suggests that some, if not all, were infected

Date of Onset

August—												
8	*12*	*16*	*17*	*20*	*21*	*25*	*26*	*27*	*28*	*29*	*31*	Total.
1 ..	1 ..	1 ..	2 ..	1 ..	1 ..	1 ..	2 ..	2 ..	1 ..	1 ..	4	.. 18

whilst in camp. Evidence is, however, against any source of infection in Brighton. One case of typhoid was reported there in February, and since then only three cases with onsets on August 19th, 23rd, and 24th, all of which had been infected in Bournemouth. Dr. Forbes presumes that the infection was conveyed by one of the girls who at home had no opportunity of infecting others but was able to do so under camping conditions. The last of the guides went home on August 8th and no cases other than those infected in Bournemouth have since been reported in Brighton.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 29TH, 1936

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1343; diphtheria, 872; enteric fever, 383; pneumonia (primary or influenzal), 342; puerperal fever, 27; puerperal pyrexia, 108; cerebro-spinal fever, 10; acute poliomyelitis, 15; acute polio-encephalitis, 2; encephalitis lethargica, 2; dysentery, 10; ophthalmia neonatorum, 91. No case of cholera, plague, or typhus fever was notified during the week.

Of the 383 notifications of enteric fever 266 were from the counties of Dorset and Southampton, as was explained in a note last week on the outbreak in the Bournemouth area. The figures from Dorset were made up of Poole, M.B., 105; Swanage, 1; Wimborne and Cranborne R.D., 2; from Hampshire they were made up of Bournemouth C.B., 135; Christchurch M.B., 17; Southampton C.B., 2; Portsmouth, C.B., Aldershot M.B., Gosport M.B., and Winchester M.B. each 1.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 4th was 2687, which included: Scarlet fever, 800; diphtheria, 739; measles, 182; whooping-cough, 422; puerperal fever, 10 mothers (plus 5 babies); encephalitis lethargica, 283; poliomyelitis, 1. At St. Margaret's Hospital there were 13 babies (plus 5 mothers) with ophthalmia neonatorum.

Deaths.—In 122 great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 6 (0) from measles, 2 (0) from scarlet fever, 15 (4) from whooping-cough, 23 (2) from diphtheria, 36 (8) from diarrhœa and enteritis under two years, and 12 (1) from influenza. The figures in parentheses are those for London itself.

Stoke-on-Trent reported the only death outside London from enteric fever. Of the deaths from diarrhœa and enteritis 5 were in Sunderland, no more than 2 in any other large town. Hull had 3 fatal cases of measles.

The number of stillbirths notified during the week was 277 (corresponding to a rate of 41 per 1000 total births), including 40 in London.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

THE following officers qualified at the examination for promotion to surgeon commander held recently: Surg. Comdr. E. R. Sorley, Surg. Comdr. (provisional) L. Lockwood, R.A.N., Surg. Lt.-Comdrs. J. M. Sloane, T. F. Crean, W. P. E. McIntyre, E. T. S. Rudd, L. P. Spero, E. H. Rampling, E. E. Malone, and C. B. Nicholson.

Surg. Comdr. W. G. C. Fitzpatrick to *Victory* for R.N. Hosp., Haslar.

Surg. Lt.-Comdrs. A. K. Stevenson to *Bideford*; J. W. L. Crosfill to *President* for course; G. Rorison and T. G. B. Crawford to *Victory* for R.N.B.; E. J. Mockler to *Neptune*; T. G. B. Crawford, D. A. Newbery, J. J. Keevil, C. T. Hyatt, F. Dolan, F. W. Besley, and T. L. Cleave to *President* for course.

Surg. Lt.-Comdr. (D) H. V. Pell to *Ganges*.

Surg. Lts. D. Shute to *Drake* and to *Pembroke* for R.N.B.; S. H. R. Price to *Vernon*; S. K. Foster to *Exmouth*; C. J. Mullen to *Victory* for R.N.B. and to *President*; and R. H. A. Turner to *Fowey*.

Surg. Lts. (D) H. P. L. Rhodes to *Victory* for R.N.B.; and W. R. Knott and A. J. Staple to *Drake* for R.N.B.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt.-Comdrs. J. D. Simpson to *Curacoa* and R. W. H. Tincker to *Furious*.

Surg. Lts. R. D. Jenkins to *Furious* and N. A. Vernon to Haslar Hosp.

Proby. Surg. Lt. W. I. D. Scott to *Ramillies*.

Surg. Sub-Lt. J. A. Shepherd promoted to Surg. Lt.

Surg. Sub-Lt. W. H. Osborn to *Pembroke* for R.N.B.

ROYAL ARMY MEDICAL CORPS

SUPPLEMENTARY RESERVE OF OFFICERS

Lt. W. H. H. J. de Wytt to be Capt.

ARMY DENTAL CORPS

Short Service Commission: H. M. Barbour to be Lt. (on prob.).

ROYAL AIR FORCE

Flight Lt. G. A. M. Knight to Central Medical Establishment, London.

INDIAN MEDICAL SERVICE

Col. J. B. Grogan, Brit. Serv., has vacated the appointment of A.D.M.S., and Col. E. M. O'Neill, D.S.O., Brit. Serv., has been appointed.

Capt. P. H. Addison has succeeded Capt. W. S. Morgan as medical officer at Kitchener College, Nowgong.

COLONIAL MEDICAL SERVICE

Dr. S. A. Jones has been appointed Government Medical Officer, Palestine; Dr. P. J. Caffrey becomes Senior Medical Officer, Nigeria; Dr. D. C. M. MacPherson, Pathologist, Fiji; and Dr. A. C. Paterson, Senior Specialist, Gold Coast.

SOUTHEND GENERAL HOSPITAL.—Lord Iveagh has announced his intention of subscribing £500 a year for the next seven years to the income of this hospital in the hope that others may see their way to do the same. An extension of the nurses' home is becoming essential.

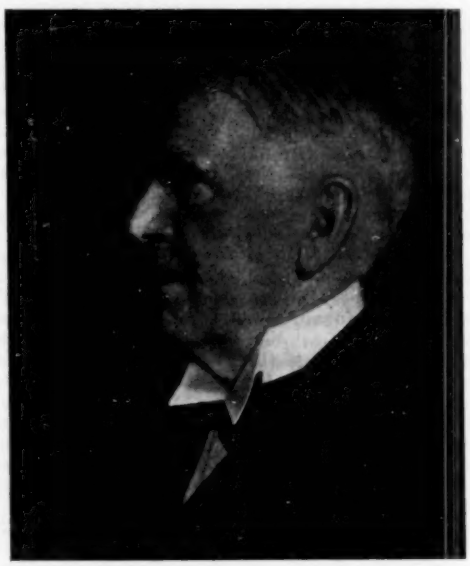
OBITUARY

LORD MOYNIHAN, K.C.M.G., C.B.

LATE PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE death occurred on Sept. 7th at his house, Carr Manor, Leeds, of Lord Moynihan, after a brief illness. Lady Moynihan had died in the previous week and he was present at her funeral, but two days later on Saturday, Sept. 5th, he was taken seriously ill and he died without recovering consciousness from the seizure.

Berkeley George Andrew Moynihan was born in Malta in 1865, the son of Captain Andrew Moynihan, V.C., who gained the Victoria Cross in 1856 with remarkable gallantry while serving with the 90th Light Infantry in the Crimea. The son was educated at the Royal Naval School, with the idea of entering the Navy, but on a changed intention he went for his medical training to Leeds, with which city his name is fitly associated in his full title as a peer; and no finer training ground in the country for a young surgeon could have been found than Leeds in the 'eighties. The Leeds School of Medicine, later united with the Yorkshire College, was one of the three constituents of the old Victoria University. The curriculum of the medical school was at that time arranged mainly to meet the requirements of the Royal College of Surgeons of England and the clinical work was done at the Leeds General Infirmary. The infirmary had then an average of over 450 beds, and on the surgical side the veterans Claudius Wheelhouse and Pridgin Teale were still consulting surgeons, while T. R. Jessop had more than a provincial reputation, and Mayo Robson and Littlewood were first-class men. Moynihan's course as a student was a series of successes. He qualified with the English double diplomas in 1887, and in the same year graduated in medicine at the University of London. He took the degree of M.S. Lond., with the gold medal, and the diploma of F.R.C.S. Eng. in 1890, and acted as house surgeon to Mayo Robson. This appointment had a profound influence on his career. Robson was a very original surgeon and when Moynihan served under him in 1887 and 1888 Robson had already done notable work on the surgery of the biliary passages, the stomach, intestines, and pancreas. Moynihan at first followed his senior's lines, gathering as much or more from experience gained when aiding Robson in a large private practice as from the clinical work in the infirmary. He was, after a period of post-graduate study in Berlin, elected assistant surgeon to the institution and early showed both his skill and boldness as an operating surgeon and in particular a gift for writing with wonderful clearness and distinction on the important clinical subjects which he and Mayo Robson for some years made almost a field of their own.



[*Photograph by Lafayette*

As early as 1898 Moynihan published some ingenious suggestions for the technique of abdominal operations, and in 1901 he contributed to these columns admirable notes on gastric and pancreatic operations; and during the next two years appeared practical text-books, written in collaboration with Robson, on the operative procedures demanded in sequence to gastric and pancreatic disease. In both treatises the reasons for diagnosis were given with evidence of wide reading, and the choice of procedure—often a very bold one—was justified by clear description of the technique employed. The clue to the familiarity with scientific literature was furnished by separate communications from Moynihan, who had employed and was employing all his spare time in continental clinics, where he got into close professional touch with foreign leaders. Notes in these columns on deformity of the stomach following gastric ulcer, on the diagnosis and treatment of pancreatic calculus, and on retroperitoneal hernia showed both his learning and his resourcefulness, and in 1903 was published a brief paper illustrating the wonderful opportunities with which a widening reputation was furnishing him. The paper showed that in the seven weeks from July 20th to Sept. 10th, 1903, Moynihan performed 18 operations upon the stomach, 8 upon the gall-bladder and bile-ducts, 13 upon the pelvic organs, and 5 upon the intestines. The operation in the gastric cases was usually gastro-enterostomy, performed to relieve the results of chronic ulcer; only one death occurred, that being a case of carcinoma. The operation on the gall-bladder and bile-ducts was cholecystectomy, and immediate recovery followed in all except one, in which there were deposits throughout the liver. The operations upon the pelvic organs conducted for fibrous myoma and prolapse were all followed by recovery, and the same happy result followed the operations upon the intestines, but here the recoveries was less likely to be permanent as the condition was in four out of five cases held to be malignant. This was a very remarkable experience in abdominal surgery conducted over thirty years ago, and we can appreciate the solidity of Moynihan's future work when we take into account the quality of the early performances. His important text-book "Abdominal Operations" appeared in 1904 and ran through four editions. Though entitled Abdominal Operations, only those operations were included which are common to the two sexes, and the surgery of organs like the kidney and the bladder and various operations for hernia was omitted. The book was recognised on its appearance as extremely valuable

and one which from the originality and experience of its author would be of practical service to surgeons.

From his initial standpoint Moynihan never defaulted and while he gained world-fame personally, the impulse of his life was the promotion of scientific surgery, and how far and how splendidly he succeeded is in evidence plain to all. He first founded a surgical club which in recent years has adopted his name as their own and was active in starting the Association of Surgeons of Great Britain. This had a membership of 25 surgeons drawn from the teaching centres of the provinces and the club meets annually at a home town, and visits annually a foreign clinic. Thus began a close and friendly communion of surgeons by which the ideals of surgery could be maintained and promulgated. Almost simultaneously the idea of founding the *British Journal of Surgery* was conceived in Bristol, when Moynihan was secured as the leader of the movement, while open-handed financial support was rendered from the beginning by Messrs. John Wright and Sons as publishers. What these activities have done for surgery received splendid expression at the Royal College of Surgeons of England in July last, when the resuscitated French Academy of Surgery was paying a visit to London at the invitation of the College. The two presidents, General Rouvillois and Sir Cuthbert Wallace, at a reception in the College, spoke of their common aim in the advancement of surgery, when occasion was taken to present Moynihan with a silver statuette in appreciation of his services to surgery. Prof. E. W. Hey Groves, in making the presentation, said that the committee of the *British Journal of Surgery* were using this opportunity to express their gratitude to Moynihan, first by erecting his portrait in the College, with a tablet "whose paucity of words (said the speaker) is the most eloquent way of admitting that we are incapable of describing the greatness of his services"; secondly, by presenting through him the sum of one thousand guineas to the College to be expended on some scheme of surgical research connected with his name; and thirdly, by the personal gift of the statuette. Moynihan, in replying, spoke of the improvement of surgery and the advancement of research as the preoccupations of his life. It was, he said, the lack of unity among surgeons that had led him to the thought of a catalyst in the form of a journal and then of an association. And now that he is gone we may well apply the word catalyst to the man himself, for without losing his own quality he was continuously the agent of change in others which led to the building up of surgical achievement and tradition. It was fitting that, on what has sadly turned out to be the closing public scene of his career, that the event should have taken place in the Royal College of Surgeons of England.

Moynihan's connexion with the College began officially in 1899 as an examiner for the fellowship, and Arris and Gale lecturer. In 1912, the year when he was knighted, he was elected to the council of the College and in 1920 delivered the Bradshaw lecture. In 1926 he was elected president, and in 1927 was Hunterian orator. In the oration he drew a fascinating parallel between Hunter and Lister, showing that neither is to be praised as the inventor of particular manœuvres, but both must be revered in that they had opened up to medicine a vista of victories. Moynihan was president for the unusual period of six years. The extension of term was a recognition not only of untiring official work but to the forward view which he took of the duty of the College in furtherance of its traditions. On surgical research Moynihan felt that the promotion of surgery which lay so close to his heart must be founded, and during his presidency a complete change was effected in the attitude of the College to research. His was the brain that conceived and brought about a new spirit in its workrooms. He was determined that his College should do more than merely investigate—what he called "dead material"—pathological states and anatomical problems. Many attempts had been made to introduce "vital" research into the laboratories of the Museum and College under former presidents, but all ended in failure because the council of the College of these times were averse from the introduction of vivisection into the laboratories under their immediate care. Moynihan ended all that by convincing his colleagues on the council that the College would never take its rightful place in the van of research until experiment on the living as well as examination of the dead was encouraged. He not only advocated opening the Museum laboratories to experiment on the living but led a movement which gave the Museum new laboratories and the equipment necessary to fit them for their purpose. He was the active missionary who went to the City of London and elsewhere to secure endowment for research scholarships in association with the College. He showed here his genius for getting things done; he never failed to carry through a scheme, once he had determined that the thing should be done. "Lord Moynihan's ambition," writes Sir Arthur Keith, "was to see the Hunterian ideals again restored—for experiment on the living was in Hunter's opinion at the base of all inquiries into surgical problems. He wanted the College to possess in the twentieth century what Hunter had built up in the eighteenth—a research farm in the country—an 'Earl's Court,' as Hunter's farm was called. It was just then that Sir Buckston Browne was seeking for the best means of conferring on surgery—his chosen profession—a lasting benefit. Between them there grew up the idea of an 'Earl's Court'—only planted not in Middlesex but in Kent—next door to Darwin's old home, and now known as the Buckston Browne Research Farm. The foundation-stone was laid by Lord Moynihan in 1931, and the Farm has now been in operation for three years. In that time, under the direction of my successor, Dr. John Beattie, the Buckston Browne Farm has become noted throughout the world as a centre of surgical research, fulfilling the object which Sir Buckston Browne as well as Lord Moynihan had in view."

Devoted as he was to surgery, Lord Moynihan's interests in other directions were many and in whatever he was interested he took an enthusiastic part. He was a close student of medical history (classical, medieval, and modern), and investigated the evidence for the causes of death generally assigned to historical people like Napoleon and the murdered children of Edward IV. He had highly developed artistic tastes and was a collector of both books and pictures, and it was a tragedy that his collection should have suffered from an unfortunate fire in the house in Park-square, Leeds, where he lived for many years. He had a varied knowledge of the lives and performances of doctors who, to use his own words, became "truants to medicine," and in the Linacre lecture delivered at Cambridge last May he summarised this knowledge in an interesting and amusing manner (vide THE LANCET, May 30th, 1936, p. 1254), proving his omnivorous reading and his faculty of close though generous criticism. He was interested in the promotion of athletics and was himself an enthusiastic swimmer. He was an advocate of the

legalisation of euthanasia and he had proposed to introduce a Bill in the House of Lords legalising the voluntary death of patients suffering from incurable and painful diseases. He travelled extensively, always with the promotion of surgery in view. He made himself an authority on such matters as the dissemination of tuberculosis by milk and the prevention of cancer by organised effort, and these things form but a selection of the subjects where he used his remarkable gift of lucid eloquence to promote the desired objectives. As a public speaker he had few equals. He was eloquent, clear, and witty, and his deliveries gained by his ability to speak without written notes, but memorising in a faultless manner the results of previous study of his subject.

Moynihan's war services were distinguished. At the outbreak of hostilities he was appointed consulting surgeon to the Northern Command. He served for two years with the British Expeditionary Force as consulting surgeon and later was chairman, with the rank of Major-General, A.M.S., of the council of consultants. He was made a C.B. in 1917 and a K.C.M.G. in the following year, and in 1922 received a baronetcy. In 1929 he was created Baron Moynihan of Leeds. Academic honours came to him in profusion. He was D.C.L. Oxford and Durham; LL.D. of seven universities, British and Canadian; he held honorary medical degrees from universities in South America, Ireland, Belgium, and Egypt; and was a corresponding member of surgical associations in France, Italy, and the United States.

Lord Moynihan married in 1895 Isabella Wellesley, daughter of the late Mr. T. R. Jessop, surgeon to the Leeds Infirmary, who died a week before her husband. They had two daughters and one son, the Hon. Patrick Moynihan, who succeeds to the peerage. There was a largely attended funeral service at Leeds Parish Church on Sept. 10th, and a memorial service will be held at St. Martin-in-the-Fields, London, on Monday next, Sept. 14th, at noon.

GEORGE WILLIAM NEILD JOSEPH, M.D. Liverp., D.P.H.

WE regret to record the death on August 28th of Dr. George Neild Joseph, medical officer of health for the borough of Warrington. He was the son of the Rev. J. Neild Joseph, and received his early education at the Calday Grange and Botiles Grammar schools, proceeding for his medical education to the University of Liverpool. He graduated with honours as M.B., Ch.B. in 1907, served as house surgeon in the eye, nose, and throat departments in the Liverpool Royal Infirmary, and the Liverpool Lock Hospital, and in 1910 was appointed resident medical officer to the Mill-road Infirmary, Liverpool. Dr. Nathan Raw writes as follows of him as a colleague at the infirmary: "He was my junior at the infirmary for about two years. He came after a brilliant academic career at the University of Liverpool. He was a hard worker in the wards and specially interested in bacteriology in the laboratory. I foreshadowed a fine career for him, when he left us for public work. He had a charming personality and was a valuable and devoted colleague."

In 1912 Dr. Joseph, having obtained the diploma of D.P.H. Liverp., was appointed assistant medical officer of health and school medical officer for the county borough of Warrington, proceeding almost immediately to the senior post, while he acted at the same time as bacteriologist to the Warrington Infirmary. He used the opportunities offered to make practical contributions to *Public Health*, the *Journal of the Royal Sanitary Institute*, and the *British Medical Journal* and the *Medical Officer*, writing on maternity and child welfare work, on prophylaxis in venereal disease, on sporadic bacillary dysentery, and on the public questions arising out of the accurate diagnosis and ætiology of blindness, the last subject being one with which he had made himself closely acquainted.

Dr. Neild Joseph was a man of wide accomplishment and his death at the age of 56 is a loss to public medicine.

ARCHIBALD DOUGLAS HAMILTON, M.D.Lond.

Dr. A. D. Hamilton died at his residence, Bratton, Wiltshire, on August 24th. Born at Chester in 1877, the second son of Dr. A. Hamilton, now of Deganwy, North Wales, he started his medical education at University College, Liverpool, subsequently proceeding to St. Thomas's Hospital medical school, where he took the degrees of M.B. and B.S. London University. He then filled house appointments at St. Thomas's Hospital, Evelina Hospital for Children, and Wolverhampton General Hospital, after which he proceeded to the M.D. degree. In 1904 he commenced practice in Chester in partnership with his uncle, and was appointed honorary physician to the Chester Royal Infirmary. Unfortunately his health broke down and he was obliged to relinquish his practice and rest for six months, when he obtained an appointment as second M.O. to the Ashanti Goldfields Corporation at Obuasi on the Gold Coast. Returning to England on leave early in 1915, he joined the R.A.M.C. as a captain, but shortly had the misfortune to develop a severe attack of pneumonia, with complications. Ultimately recovering, he spent the remainder of his war service as medical officer at Kinmel Park Hospital, Rhyl. On demobilisation in 1919 he joined his brother-in-law, the late Dr. Tom Lockett of Melksham and started practice in Lacock, Wilts. Here he took an active part in medico-social affairs, serving as secretary of the local branch of the B.M.A., and on the local medical and panel committees. He also did much useful work with the county branch of the Red Cross, and was a district medical officer under the public assistance authority. Early in 1934 he retired to the peace and quiet of Bratton, where his last illness was borne with patience and fortitude.

WILLIAM JOHN TAGGART, M.B., Ch.B. Edin.

THE death is announced of Dr. W. J. Taggart, a well-known Belfast practitioner, which took place unexpectedly on August 29th whilst he was on holiday. He graduated in medicine at Edinburgh University in 1905, and was for a period resident medical officer at the Victoria Hospital, Burnley. Here he worked with Sir James Mackenzie for two years, and there is little doubt that this experience influenced him afterwards in his conduct of practice. During the war he served in Mesopotamia with the rank of Capt. R.A.M.C., and on the cessation of hostilities came to practise in Belfast. Dr. R. S. Allison writes of him: "His judgment of cases was extraordinarily good; nothing was too much trouble for him, and he had the ability of inspiring confidence in his patients to an unusual degree. He settled in practice on the Antrim-road, Belfast, and during the past 25 years built up an extensive connexion, becoming one of the best-known and most highly respected practitioners in the city. For a time he held an appointment as honorary anæsthetist

to the Royal Victoria Hospital; he was of a quiet and retiring disposition and took no part in public affairs. He was well beloved by his colleagues for his honesty and sincerity, and his untimely death at the age of 52 comes as a sad blow to all those who knew him. Deep sympathy is extended to his wife and children."

CLEMENT STURTON, M.B. Camb., F.R.C.S. Eng.

Dr. Sturton's early death at the age of 36 brings to an end a career of promise. At St. John's College, Cambridge, he won an exhibition and received second-class honours in the natural science tripos in 1920. In the same year he gained a joint Shuter scholarship at St. Bartholomew's Hospital. Five years later he passed the F.R.C.S. Eng. His religion was sane and virile, and his goal the mission field, and accordingly he worked in the Belgian Congo with the Africa Inland Mission. Later he joined Government service and was placed in charge of a hospital at Lagos, Nigeria. On his return to England he entered into partnership with Dr. A. G. Tolputt and Dr. T. H. Baillie at Kettering, Northants, and was on the staff of the Kettering Hospital.

Dr. Sturton married Mary, second daughter of Dr. Jabez Pratt Brooks. She survives him with three children.

W. McA. E.

CORRESPONDENCE

INFRINGEMENT OF THE CIVIL RIGHTS OF EXPERTS

To the Editor of THE LANCET

SIR,—In your issue of August 22nd Dr. Tudor Jones draws attention to a method by which university authorities are infringing civil liberties. As examples of this type of "New Despotism" he records the fact that the University of Brisbane has already stripped the members of its teaching staff of all political rights but the right to vote, and that now the University of Adelaide has decreed that "no professor shall sit in Parliament or become a member of any political association; nor shall he (without the sanction of the Council) give private instruction or deliver lectures to persons not being students of the University." The supposedly intelligent and usually law-abiding professor is to be deprived of his rights as a political citizen, whilst the individual who does not labour under such academic disadvantages is free from these restrictions.

For professors who neglect their academic duties because of the time given to parliamentary ones, disciplinary measures could no doubt be invoked without a general prohibition of their right to sit in Parliament. A much more serious matter is the denial of the right to political association. This is the denial of an established democratic right, and in the continental countries where it has been lost restrictive regulations imposed on cultural and religious groups have followed. The stock sizes and prevalent colourings of contemporary political shirts may not appeal to all of us, but to deprive the professor of so useful a garment as a shirt, however pale its colour, is to deprive him of an elementary article sanctioned by custom and essential to human dignity.

The professor is furthermore enjoined: "neither shall he (without the sanction of the Council) give private instruction or deliver lectures to persons not being students of the University." This almost suggests that the professor is regarded as a baneful influence in the community, over whom a benevolent council exercises a wise and restraining influence.

At a time when political events are unfortunately tending to separate communities into violently opposed camps, such an academic restriction is a dangerous encroachment. If academic life is really of value to the community, then its leaders are more likely to preserve a detachment of view and are less likely to be swayed by the events of the moment. For the very reason that there is a real danger of separating the community into sheep and goats, it is imperative that academic influence should be untrammelled if extreme courses are to be avoided. A plague of political professors is as unlikely as it is undesirable, but there is no justification for allowing a fear of this to result in the prohibition of all political association, or for the restriction of the liberties of the professor in the various ways in which he can be of value to the community.

Public opinion would not tolerate a government which attacked the liberty of association in the way that the University of Adelaide has done. Yet this liberty may be attacked from within and piecemeal. Academic freedom is no more immune from infringement than are our other liberties, and it is only likely to be preserved if it is regarded as something of inestimable value to the community, and only if its defenders have sufficient independence to insist on their rights as citizens.

I am, Sir, yours faithfully,

Harley-street, W., Sept. 8th. REGINALD T. PAYNE.

THE EARNINGS OF WOMEN PRACTITIONERS

To the Editor of THE LANCET

SIR,—The gross income figures supplied by some of the general practitioners were not quoted in the analysis of the Fate of a Population of Women Medical Students (THE LANCET, 1936, i., 1370) undertaken on behalf of the St. Mary's Medical Women's Association, to which you referred in your leading article on August 29th (p. 25). But to the best of our recollection, Dr. M. H. Kettle, who is abroad on holiday, found them to average more than double the figure of £400 mentioned by you as the average earnings of a (very small) group of female practitioners who qualified in 1930. It is true that the St. Mary's medical women represent on the whole more senior practitioners, the first batch qualifying in 1919. But we refer to their relative success because your suggestion that a gross income of £400 a year five years after qualification indicates a "satisfactory result as to professional prospects" may unduly discourage girls from becoming doctors, or at least from embarking on general practice. Such a prospect would certainly not be regarded as satisfactory by women students, and they will trust that among the 56 per cent. of doctors who did not reply to your questionnaire last year were many women so fully occupied in coping with patients that they neglected to fill up the form sent to them.—We are, Sir, yours faithfully,

E. D. FENWICK,
HELEN DAVENPORT,
Joint Hon. Secretaries, St. Mary's Hospital Medical Women's Association.

London, Sept. 4th.

*** It is on the assumption that most women entering practice either put up a plate or buy a

small share in an existing practice that we regard a gross income of £400 as satisfactory in the early years. No one would suggest that a permanent income of this order would be adequate in view of the long and expensive training and the strenuous life of a doctor.—ED. L.

SAFE CATGUT

To the Editor of THE LANCET

SIR,—I should be glad if you would allow me space to correct a misapprehension which may arise as a result of the circular issued by the Minister of Health and reviewed on p. 579 of your last issue. References are made to "internally sterile" and "partially sterile" catgut which suggest that *all* material of this description is inaccurately labelled. Whilst admitting the danger which does exist through the use of dry catgut to which the above descriptions have been loosely applied, it should be emphasised, in fairness to and as a reassurance to the many hospitals purchasing "sterile interior" catgut from reliable sources, that catgut genuinely answering to this designation is obtainable. Catgut sterilised by the same immersion in aqueous iodine solution as is used for the preparation of that which is sold under licence as "Sterile, T.S.A.," is, as claimed, free from all pathogenic anaerobic organisms of intestinal origin. Such "sterile-interior" gut is dried and sold at an economic price to institutions which then prepare it for use by giving only a simple "surface-cleaning" with a spirituous solution of iodine. Tests by various workers both in the United Kingdom and in the Dominions have shown that catgut so prepared is sterile.—I am, Sir, yours faithfully,

ELDRED J. HOLDER,
Director and Chief Chemist, G. F. Merson Ltd.

Edinburgh, Sept. 7th.

MEDICINE AND THE LAW

Inquests and Police Prosecutions

THERE should be some kind of comity between the different courts of the country. The Chester coroner had reason therefore to make his protest when the police intervened in a case which, so far as concerned the coroner's court, was still sub judice. A farm labourer had been killed by a car which mounted the pavement. An inquest was opened on July 28th and was adjourned to Sept. 4th, since no other witnesses save the driver and his passenger were available, and it was hoped that independent evidence might be found. As the result of a broadcast message four eye-witnesses were traced. Their statements were furnished to the coroner, but, on Sept. 2nd, the police prosecuted the driver for alleged dangerous driving and the charge was dismissed. Thus, instead of the police assisting the coroner to obtain the material for decision at the resumed inquest, they intervened to prejudice and stultify his inquiry. Parliament in 1926 amended the law in order to avoid parallel and simultaneous investigations by the coroner and by the police. Where the police decide to take proceedings on a charge of murder or manslaughter, the law now provides that the coroner suspends his functions and leaves the issue to be determined by the magistrates and at assizes. For the police to take action on the minor charge of dangerous driving is, as the Chester coroner observed, an extraordinary procedure. Parliament has not yet abolished the coroner even if critics have occasionally railed at the inquest as superfluous, embarrassing, and mischievous. While the coroner remains, he is entitled to be treated with courtesy, and to exercise the judicial discretion with which he has been entrusted.

MEDICAL NEWS

University of Birmingham

In connexion with the opening of the session in October, it has been arranged to hold a series of post-graduate lectures at the General, Queen's, and Children's Hospitals, for old students of the school, on Tuesday and Wednesday, Oct. 6th and 7th. Sir Reginald St. Johnston, M.R.C.S., late governor of the Leeward Islands and a past student of the school, will present the prizes and give an address on Tuesday at 5 P.M. in the medical theatre, Edmund-street, and the annual dinner will be held at the Grand Hotel at 8.15 on the same evening.

Middlesex Hospital

The annual refresher course for former students of this school will begin on Friday, Oct. 2nd, at 2.15 P.M., and continue up to the afternoon of Oct. 4th. The annual dinner for past and present students will be held on Oct. 2nd at the Savoy Hotel at 7.30 P.M.

Medical Peace Campaign

A meeting of members of the medical profession will be held on the evening of Thursday, Sept. 24th, in the Hastings Hall, British Medical Association House, Tavistock-square, W.C.1. The purposes of the meeting are: (*a*) to receive a report from members of the profession who attended the Medical Commission at the International Peace Congress held in Brussels; (*b*) to consider what methods may be usefully employed for awakening the profession as a whole to the necessity of exerting its undoubted influence for the preservation of the world's peace, bearing in mind that from the medical point of view this might be esteemed a prophylactic task of supreme importance. The chair will be taken at 8.30 P.M. sharp by Dr. E. P. Poulton.

King's College Hospital

Lectures and demonstrations open to all medical practitioners will be held at this hospital on Saturday, Oct. 24th, and Sunday, Oct. 25th, before the beginning of the new session. The annual dinner of past and present students will take place on Oct. 24th at the May Fair Hotel at 8 P.M. and Mr. H. A. T. Fairbank will take the chair.

Westminster Hospital

The annual dinner of old students of this school will be held on Saturday, Sept 26th, at the Trocadero Restaurant at 7.30 P.M., when the chairman will be Mr. Tudor Edwards. On Sept. 26th and 27th an intensive post-graduate course, open to all medical practitioners, will be held at the school. On Monday, Sept. 28th, Lord Horder will deliver the inaugural address at the Caxton Hall, S.W., at 3 P.M.

Central London Throat, Nose, and Ear Hospital

A course in methods of examination and diagnosis will be held at this hospital from Sept. 28th to Oct. 2nd at 4.30 daily. A course in anatomy and physiology for Part I. of the D.L.O. examination will be given by Mr. E. P. Stibbe from Oct. 5th to 17th, while a clinical course for Part II. has been arranged to take place from Oct. 19th to 31st.

The annual address of the hospital will be given at 4 P.M. on Friday, Oct. 9th, by Dr. D. R. Paterson, consulting surgeon for diseases of the ear, nose, and throat to the Cardiff Royal Infirmary. He will speak on upper dysphagia. The usual Friday lectures, to which medical visitors are invited, will be held throughout the winter and will be announced in our Medical Diary.

British College of Obstetricians and Gynæcologists

The annual dinner of the College will be held at Claridge's on Friday, Oct. 23rd, at 7.30 for 8 P.M.

Royal Sanitary Institute

The council of this institute have accepted an invitation from the Birmingham city council to hold next year's Health Congress at Birmingham from July 12th to 17th.

Institute of Medical Psychology

Prof. C. G. Jung, of Zurich, will lecture to members of the medical profession at the Institute of Medical Psychology in Malet-place, on Wednesday evening, Oct. 14th. His subject will be Psychology and National Problems.

An Exhibition of Smoke Abatement

On Oct. 2nd Sir Kingsley Wood, Minister of Health, will open at the Science Museum, London, an exhibition demonstrating the causes and effects of atmospheric pollution. It has been arranged by the National Smoke Abatement Society in conjunction with the Science Museum, and will remain open throughout October.

A Clinic for Diabetic Children

A clinic opened at King's College Hospital, London, last Saturday is described as the first of its kind in this country. At the opening ceremony Dr. G. F. Still, who presided, said that 25 years ago the idea of a special clinic for diabetic children would have seemed but a grim jest, but now the outlook has been entirely altered. The new department is in charge of Dr. R. D. Lawrence.

Leeds Public Dispensary and Hospital

A series of post-graduate lectures, open without fee to all members of the medical profession, will be given at this hospital during the winter. They will be held every Wednesday at 4 P.M., and the following members of the honorary staff will take part: Mr. A. D. Sharp, Mr. A. Gough, Dr. H. H. Moll, Dr. S. J. Hartfall, Dr. H. G. Garland, and Mr. L. N. Pyrah. Particulars of the course will appear weekly in our Medical Diary.

Grocers' Company Scholarships

An election for three of the scholarships which the Grocers' Company offers with the object of encouraging original medical research will take place in May, 1937. Each scholarship is worth £300 per annum, and an allowance is given for apparatus and other expenses in connexion with the work. The scholarships are tenable for one year but are renewable for a second or third year. Applications must be sent before the end of April to the clerk, Grocers' Hall, London, E.C.2.

Vacancies

For further information refer to the advertisement columns

Acton Hospital, W.—Cas. O., at rate of £150.
Barnstaple, North Devon Infirmary.—Res. M.O., at rate of £150.
Benenden, Kent, National Sanatorium.—Sen. and Jun. Asst. M.O.'s, at rate of £200 and £150 respectively.
Birkenhead Municipal Hospital.—Sen. Res. M.O., £350.
Bolingbroke Hospital, Wandsworth Common, S.W.—Res. M.O., £200.
Bradford Royal Infirmary.—Two additional H.S.'s, each £150.
Brentwood, Essex County Mental Hospital.—Jun. Asst. M.O., £510.
Bristol Royal Infirmary.—Asst. to Cancer Research Dept., £300.
Burnley Victoria Hospital.—H.S., at rate of £150.
Burton-on-Trent, Breiby Hall Orthopædic Hospital.—Res. H.S., at rate of £200.
Caernarvonshire and Anglesey Infirmary.—Jun. H.S., at rate of £100.
Canterbury, Kent, and Canterbury Hospital.—H.S., at rate of £125.
Cardiff, King Edward VII. Welsh National Memorial Association.—H.P. for Adelina Patti Tuberculosis Hospital, at rate of £150.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall.—H.P., at rate of £150.
Coventry and Warwickshire Hospital.—H.S. to Aural and Ophth. Dept., at rate of £125.
Croydon County Borough.—Asst. M.O.H. and School M.O., £500.
Derbyshire Hospital for Sick Children.—Res. H.P., at rate of £130.
Derbyshire Royal Infirmary.—Cas. O. and Orthopædic H.S., £150.
Eastbourne, Princess Alice Memorial Hospital.—Res. H.S., at rate of £150.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Hon. Asst. Surgeon to Throat, Nose, and Ear Dept. Asst. Radiologist, £100. Also third H.S., at rate of £50.
Grimsby and District Hospital.—Jun. H.S., £150.
Grocers' Company, Grocers' Hall, E.C.—Three Medical Research Scholarships, each £300.
Halifax General Hospital.—Jun. Res. M.O., £250.
Hampstead General and N.W. London Hospital, Haverstock Hill, N.W.—Cas. M.O. for Out-patient Dept., at rate of £100.
Herefordshire General Hospital.—H.S. and Cas. O., £100.
Home Office, Whitehall, S.W.—Asst. Medical Inspector for Children's Branch, £550.
Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Surg. Reg., £200. Half-time Out-patient Med. Reg., £175. Also Res. H.P. and Res. H.S., each at rate of £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S., at rate of £75.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O., at rate of £200.
Ilford, King George Hospital.—H.P. and H.S., each at rate of £100.
Indian Medical Service.—Commissions.
Infants Hospital, Vincent-square, Westminster, S.W.—H.P., at rate of £100.
L.C.C.—Part-time Obstetrician and Gynæcologist, £800. Temp. District M.O.'s, £135–£285. Also Med. Practitioners for sessional work in Antenatal Clinics, £1 11*s.* 6*d.* a session.
Manchester, Ancoats Hospital.—Res. M.O., at rate of £150. H.S., at rate of £100. Also Clin. Asst., 10*s.* 6*d.* per Clinic.
Manchester Ear Hospital, Grosvenor-square, All Saints'.—Res. H.S., £120.
Margate and District General Hospital.—Res. M.O., £150.
National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Res. M.O., £200.
Newcastle General Hospital.—H.S. and H.P., at rate of £150.
Newport County Borough.—Asst. M.O.H., £500.
Newport, Mon., Royal Gwent Hospital.—H.P., at rate of £150. Also three H.S.'s, two Cas. O.'s, each at rate of £135.
New Zealand, Auckland Hospital.—Deputy Med. Supt.
Norwich, Norfolk and Norwich and Jenny Lind Hospitals.—Registrar to Orthopædic Depts., £500.
Plymouth, Prince of Wales's Hospital.—H.S. for Lockyer-street Hospital, at rate of £150.
Preston and County of Lancaster Royal Infirmary.—Cas. H.S., £150.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P., at rate of £125.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist, at rate of £100. Res. Anæsthetist and District Res. M.O., at rate of £90. Also Asst. Res. M.O., at rate of £80.
Queen Mary's Hospital for the East End, Stratford, E.—Dermatologist.
Reading, Royal Berkshire Hospital.—Res. Anæsthetist, £250.
Rochdale Infirmary and Dispensary.—Second H.S. and H.P., each £150.
Rotherham Hospital.—H.P., £180.
Royal Cancer Hospital, Fulham-road, S.W.—Sen. Asst. Radiologist, £350.
Royal Chest Hospital, City-road, E.C.—Hon. Physician.
Royal College of Surgeons of England.—Two Court Examiners. Also Examiner in Dental Surgery.
Royal Eye Hospital Medical School, St. George's Circus, S.E.—Research Scholarship, £100.
Royal Free Hospital, Gray's Inn-road, W.C.—Anæsthetic Registrar, £100.
St. Bartholomew's Hospital, E.C.—Asst. Surgeon, £750.
St. Pancras Dispensary, 39, Oakley-square, N.W.—Hon. Physician.
Salford Royal Hospital.—Two H.S.'s, each at rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S., at rate of £100.
Sheffield Children's Hospital.—H.S., at rate of £100.
Sheffield Royal Hospital.—Clin. Asst. to Ophth. Dept., £300.
Shrewsbury, Royal Salop Infirmary.—Res. H.P. and Res. H.S., each at rate of £160.
South Eastern Hospital for Children, Sydenham, S.E.—Res. M.O., at rate of £100.
South London Hospital for Women, Clapham Common, S.W.—Clin. Assts. for Skin Out-patients.
Southend-on-Sea General Hospital.—H.P., Res. Obstet. O., and two H.S.'s, each at rate of £100.
Southern Rhodesia Government.—Medical Inspector of Schools, £800.
Stoke-on-Trent, Stanfield Sanatorium.—Tuber. O. and Med. Supt., £650.
Sudan Medical Service, Stack Medical Research Laboratories.—Bacteriologist, £E.720.
Sunderland Royal Infirmary.—H.P., £120.
Walsall General Hospital.—Res. Surg. O., £300.
Warrington Infirmary and Dispensary.—Third Resident, at rate of £150.
Warwick, King Edward VII. Memorial Sanatorium, Hertford Hill.—Jun. Asst. M.O., at rate of £250.
West London Hospital, Hammersmith-road, W.—Res. Asst. Surg., £200. H.P. and H.S., each at rate of £100. Also Hon. Asst. Radiologist (Diagnosis).
Wigan, Royal Albert Edward Infirmary and Dispensary.—H.S., at rate of £150.
Willesden Corporation.—Asst. M.O., £600.
Willesden General Hospital, Harlesden-road, N.W.—Cas. O., at rate of £100. Also Asst. M.O., £50.
Wolverhampton and Midland Counties Eye Infirmary.—Registrar, £250.
Wolverhampton, New Cross Hospital.—Res. Asst. M.O., £200.
Worthing Hospital.—H.P., at rate of £130.

Medical Referee under the Workmen's Compensation Act, 1925, for the Atherstone, Coventry, and Nuneaton County Court Districts (Circuit No. 23). Applications should be sent to the Private Secretary, Home Office, Whitehall, London, S.W.1, not later than Sept. 23rd.

NOTES, COMMENTS, AND ABSTRACTS

NATURAL SELECTION AND EVOLUTIONARY PROGRESS

Abstract of the presidential address given by Prof. JULIAN HUXLEY, M.A., D.Sc., *on Sept. 10th at Blackpool to the British Association, Section of Zoology.*

ANYONE'S choice between the several available explanations of the mechanisms of evolution is likely to be influenced by his experience and the particular aspect of the facts which has engaged his attention. The palæontologist, contemplating the long range series which constitute his material, has often inclined to believe in orthogenesis, and hold that evolution is a predetermined process aiming at some definite end and relatively indifferent to passing events. The naturalist and physiologist are more likely to be impressed with adaptation and to incline either to regard natural selection as the only consideration, or to feel sympathy with Lamarckian use-inheritance. Contrary to Darwin's view, selection is now known to be incapable of extending the extreme limits of natural variation and cannot therefore by itself cause evolutionary change. Nor can mutation alone be an efficient explanation as some geneticists have held for it cannot account for the maintenance of a given direction. It has however its share, for in the light of the reorientation made possible by modern knowledge evolution is seen to be the joint product of mutation and selection.

Some of the criticisms of Mendelian change as an effective agent in evolution have lost much of their cogency. Though in the early stages of their study genes could be recognised only by characters, the notion of Mendelian characters must now be dropped. A given gene does not necessarily always have the same effect, and its actual influence on the appearance of an organism is dependent upon the coöperative action of a number of other genes. Each change in a gene is buffered by ancillary changes in other genes; it is the gene-complex which evolves and this may happen by a series of steps so small as to give an appearance of continuity. It is also possible for a gene to alter its character by such fine gradations that the discontinuity which is inherent in Mendelian genetics is no obstacle to the visible continuity of a palæontological series.

Another difficulty has been that most mutations are harmful which is what is likely to occur with any random change in the elaborately coördinated system of a living organism. This is most probable with the larger changes, and it should be noted that it is these which are most likely to be detected by the geneticist. It is however now known that many gene-differences have very small effects, down almost to the limit of detectability, and it is probable that it is these which form the chief building stones of evolution. Whether too a given change is injurious or not may depend on the environment. Thus the mutant of Drosophila which has vestigial wings is ordinarily much shorter lived than the normal form, but under conditions of starvation it lives longer and might under conditions which sometimes become very unfavourable might oust the other. Or again a mutant tobacco has been observed which failed to flower until the ratio of light to darkness was altered to what would correspond to a semi-tropical summer under which conditions it was a better performer than the type.

The origin of species is only one aspect of evolution. They may arise in a variety of ways. Thus one species may become transformed gradually until it deserves a new specific name; or it may separate, also gradually, into two or more divergent lines separated geographically or by mutual infertility. In other instances a fresh species may arise by hybridisation and polyploidy, that is by the convergence of two species rather than the divergence of one. A good example is the rice grass *Spartina townsendii*, recognised about 50 years ago; it is a hybrid between the English *S. stricta* and the American *S. alterniflora*, and has overrun the mud in Southampton Water and Poole Harbour—a sudden change which was certainly not injurious.

Every organism is a bundle of adaptations, more or less efficient, coördinated in greater or lesser degree. Ruling out special creation, divine guidance, purposive vital urges, and Lamarckism, we are left with natural selection which is an adequate explanation, though it should be realised that all it can do is to ensure survival. Thus we must invoke natural selection where an adaptive structure involves a number of separate steps. A one-character, single-step adaptation might clearly be the result of mutation. But when two or more steps are involved, it is inconceivable that they should have originated simultaneously The first mutation must have been spread through the population by selection before the second could be combined with it, the combination of the first two selected in turn before a third could be added, and so on. Most adaptations clearly involve many separate characters, and the improbability is enormous that they can have arisen without the operation of some agency which can gradually accumulate and combine the contributory change; natural selection is the only such agency which we know. Each single species is the product of a long series of selected mutations; to produce these adapted types by chance recombinations in the absence of selection would need an assemblage which would fill the universe and outrun astronomical time.

Those who believe in predetermined orthogenesis are mainly influenced by the long-range consistent trends in a particular direction which fossils reveal; in the end the trend dies away and the race either dies out or stops at the point it has reached. But the apparent persistence of the trend towards a determined goal is not only explicable but to be expected from a selectionist viewpoint. For once a trend has begun much greater changes will be necessary to switch the stock over to some other mode of progress than to improve the arrangements for the existing mode of life.

The time-relations of selection are also of interest. It is true that elimination mostly occurs in the young stages of animals and plants, before they have developed their adult characters. But it is the adults which reproduce and selection among them is just as effective whether they represent 10 or 0·01 per cent. of the fertilised eggs from which they have come. Particularly important is the intra-uterine competition of the young of polytocous mammals. So urgent is this, that it is impossible to slow down the rate of development, and it was only when man's ancestors gave up having litters that it was possible to have the prolonged fœtal and juvenile life on which man's essential qualities so much depend. Intra-uterine selection may also be the explanation of the progressive increase of size among mammals in their evolutionary course and of the various consequences.

It is a common fallacy that natural selection must always be for the good of the species. In actual fact intraspecific selection often leads to results which are useless and in some instances harmful. It is indeed possible to argue that competition between adults of the same species generally renders the species as a whole less successful in coping with its environment. Hence the error of the militarists and laisser-faire economists who say that all man needs to do to achieve further progressive evolution is to encourage the most thorough-going competition; the more ruthless the competition, the better the result. Natural selection is efficient in its way, but it is blind and mechanical; it is not the instrument of a God's sublime purpose nor is it even the best mechanism for achieving evolutionary progress.

And what is meant by evolutionary progress? Broadly it means independence and control of the

environment: in more detail, size, and power, mechanical and chemical efficiency, increased capacity for self-regulation and more efficient avenues of knowledge. One-sided progress is better called specialisation, and it may land those who indulge in it into an impasse; birds for instance entered the kingdom of the air when they invented wings but in so doing they cut themselves off from any further progress. On the contrary, lungs and egg shells which made land vertebrates possible are useful preludes to further changes; so is heat regulation which must have arisen in an environment of rapidly changing temperatures. It is also clear that if natural selection can account for adaptation and long-range trends, it can also account for biological progress for progressive changes have obviously given their owners advantages. It also seems that progress could have followed no other course than the one which it has followed. Multicellular organisation, a cœlom and a blood system are clearly necessary to achieve a reasonable level of size. The vertebrates alone have combined size, activity, and terrestrial life. Warm blood was another necessity for only in a constant environment could the brain be efficient. Birds went out of the picture by taking to the air, leaving mammals pre-eminent. Man developed eyes and hands and presently conceptual thought which is not only his exclusive prerogative but could not have been evolved on earth except in man.

Conscious thought is the latest step in life's progress, and if man were wiped out it is doubtful if it would ever be taken again. Its main effects are doubtless still to come. There are many obvious ways in which the level of intellectual performance could be raised and its upper limit exceeded. We may look forward too to the development of other faculties such as telepathy to add to the satisfactions he gets from morality, pure intellect, æsthetics, and creative activity though it is doubtful whether, unless he can concentrate reproduction in a minority, man has much chance of reaching the altruistic level of the social insects. Each major step in progress has necessitated scrapping some of the achievements of previous advances. It may be already time that we should try to get rid of the mammal that the man in us may more effectually live. And just as one advance has continually led to another, so we may be assured that further progress depends on man's capacity for thought and must be guided by deliberate purpose.

HYPERTENSION AT VARIOUS AGES

DURING the past five years Robert S. Palmer and Edward G. Thorp, at the Massachusetts General Hospital, have been collecting early cases of hypertension so as to compare them with moderately advanced and late cases met with during the same period (New Eng. Jour. Med., 1936, ccxiv., 1019). The condition was classified as mild, moderate, or severe, according to certain arbitrary criteria. Of the 224 patients collected 118 were males and 106 females. None of these are regarded as cases of primary renal disease; but the grounds for this opinion are not given, and the series contains some cases of so-called malignant hypertension which many authorities would classify as "renal hypertension." There was one case of coarctation of the aorta and one of cortical adenoma; and a man of 22, whose hypertension seemed to belong to the mild benign type, died suddenly after swimming—which once more points the moral that it is well to be chary of diagnosing simple hypertension in young subjects. Excluding these 3 cases, and a fourth too obscure to be elucidated, 220 cases were left of which 79 were graded as mild, 69 as moderate, and 72 as severe.

Various ætiological factors were considered, and it was found that a family history of degenerative vascular disease was commoner in the moderate and severe cases than in the mild ones, which perhaps meant that some of these last were cases of vasomotor instability rather than true hypertension. Obesity also was commoner in the moderate and severe groups. Undue nervous excitability was quite a common finding, but this, in the authors' view, is probably never more than a precipitating cause of high blood pressure. Among the women, endocrine abnormalities were often encountered. Of a group of seven hypertensive women under 36, only one had had no abnormality of periods or pregnancy. Four of them had had pregnancy toxæmia and the remaining two had had abnormal catamenia. Again of twelve hypertensive women between the ages of 36 and 45, four had probably had pregnancy toxæmia, four had reached the menopause early, and two had had abnormal catamenia. Only two showed no evidence of endocrine abnormality.

Palmer and Thorp suggest that chronic pyelitis, observed in two of the women of the younger group, may be an aggravating or precipitating factor in hypertension, but it is more likely that the association was fortuitous, since infections tend to be depressor rather than pressor. They also conclude that after the age of 45 essential hypertension is more serious in males, whereas below that age the more severe forms are seen in females. But this conclusion, in conjunction with the fact that in all their so-called malignant cases the patients were women, raises a further doubt whether essential hypertension was always the correct diagnosis. The authors' pessimism about prognosis—for they put the average duration of essential hypertension at only 8–10 years—contrasts strangely with their optimism about treatment.

THE WORK OF A MALARIA UNIT

MALARIA is of such importance in that part of Tanganyika territory which stretches south-eastwards from Kilimanjaro to the port of Tanga that a malaria unit has been set up for its study. Dr. D. B. Wilson has issued a report on its working during 1933 and 1934.[1] The work was planned to cover these two years, the results of one to check the other; but this hope was upset by the failure of three of the four rainy periods that would normally have fallen within this time. One effect of this failure is seen in an infectivity rate of the population (shown by the presence in blood of the sexual forms of malarial parasites) varying from 2·9 per cent. among samples taken in August, 1933, when rain had been almost absent, to 6·9 in August, 1934, when it had been more abundant; the mean for the whole period was 4·8. Wilson is greatly impressed by our lack of knowledge of the natural history of those species of anopheles which act as insect hosts to malaria parasites, but is perhaps somewhat over-impressed by the errors which have come about through the too confident application of knowledge gained in one country to problems which present themselves in another where conditions may in fact be different; his views, however, carry weight because, by the generosity of the trustees of the Carnegie Corporation of New York, he was enabled to undertake a study tour of malaria in India, and because he has been in touch with workers in London and Liverpool.

In the main the local vector of malaria is *Anopheles gambiæ*, *A. funestus* being a relatively uncommon addition; these insects prefer mud huts to the more airy ones made of coconut leaves, they are not driven from them by smoky fires, they do not leave them at daybreak, and their flight to them from their breeding places is about a mile. But it is not only inside huts that infection may be got, for in the village of Gombero, where 12·2 per cent. of female anopheles had malaria sporozoits in their salivary glands, infection was acquired when an investigation which was being carried on in the open had to be continued after dusk. It is made clear that these mosquitoes become infected mainly in the last three months of the year by feeding on children, at which season half of these

[1] Report on the Malaria Unit, Tanga, 1933–34. Dar es Salaam. 10s.

had gametes in the blood. *Plasmodium falciparum* was the commonest malaria parasite, after which came *P. malariæ*, and last *P. vivax*, but it must be noted that for the purpose of this particular classification *P. ovale* was included in and comprised about a quarter of the last, and that identification of species was made only after the views of the African staff had been checked by Dr. Wilson or his wife; the spleen was palpable in 85 per cent.; the mean hæmoglobin was 53 at birth, rising to 75 at 20 years, and falling to 71 in those 50 years old or more; and on the average each mother had 2·75 children but only 1·58 survived her, so that the indigenous population of Gombero is a falling one. But other factors were concerned in the public health here; the incidence of ancylostomiasis was over 95 per cent. as displayed by the relatively coarse diagnostic method generally known as that of Willis, but to which P. A. Maplestone lays claim; all boys in their teens had schistosomiasis; moreover, the drought of 1933 resulted in a state of real or virtual local famine. All these conditions left on Wilson's mind a persistent impression of the pitiable condition of the inhabitants shown by their quietness, slowness, poor physique, and inability to make an adequate response to any stimulus. Yet it is noted, in exception, that young people of 17 to 20, particularly girls, show that vivacity which is appropriate to this age; but it is noteworthy that, as has been said, it is just at this age that the mean hæmoglobin reaches its maximum, unsatisfactory though that is.

In Dr. Wilson's view he has failed to demonstrate ill-health from malaria in anyone over 2 years old in this highly endemic rural area; he notes that the stamping out of malaria is quite impossible at present here; and he questions whether the people would be better off if antimalarial work among them merely lessened the number of infective mosquitoes, since to do so would mean, in his opinion, a lessening of immune reaction in the people in general. "In other words," he says, "if we have no reasonable hope of abolishing malaria, are we wise to attempt to reduce it?" This despondent policy does not seem likely to be given general assent.

It is indeed clear that much work is needed here before there can be any sure conclusions as to the parts played by the different factors concerned in causing, for example, the deplorable degree of anæmia which has been noted; but in the meantime it seems wise to keep an open mind. One possible factor which has not come within the scope of the report is Bancroftian filariasis, within the endemic area which Tanga lies; yet it is particularly noted that, in Tanga, pit latrines go down into the subsoil water and that culicines breed in them so freely as to be a nuisance. This particular infective risk seems also to have escaped notice, or been under-estimated, by those who, in other countries where filariasis is endemic, have confidently advocated the general provision of bored-hole latrines deep enough to reach the subsoil water. Again that the mere building of pit latrines in a village does not sanction the label "sanitated," which it often receives, is equally evident from the description of these privies as they exist in Gombero. It may well be that just as the work of the Rockefeller Sanitary Commission, starting with hookworm infection, expanded into the wide activities of the International Health Board, so this efficient malaria unit may find itself part of a wide sanitary department whose business is to investigate and put in their right order the several factors which go to the making of the disquieting state of affairs disclosed in this valuable report.

CANCER AND TUBERCULOSIS

TUBERCULOSIS and cancer, affecting different ages, are seldom associated, and the usual explanation of this is that the tuberculous do not live long enough to develop cancer. But for many years Prof. I. Holmgren of Stockholm has suspected that this is not the whole story, and he has drawn attention to the remarkable tolerance shown by cancer patients to tuberculin. On his initiative investigations were started last year with a view to correlating the tuberculosis and cancer post-mortem findings at the St. Erik Hospital, whose occupants are mostly tuberculous patients, of all ages, and old folk, many of whom suffer from malignant disease. A preliminary report has now been presented to the Swedish Medical Society by Dr. B. Strandberg, who has scrutinised the records of all the 5366 post-mortem examinations conducted at this hospital by Prof. Henschen in the seven-year period 1929–35 (Hygiea, June 15th, p. 372). The uniformity with which the post-mortem records were made in this period added appreciably to their value, the more so as a point was made of recording all tuberculous changes, however slight, and all malignant changes, however early. There were 1206 cases of cancer and 1836 of tuberculosis—i.e., one or other was demonstrable in much more than half of all the cases coming to necropsy. Strandberg found that among those with active tuberculosis cancer was much less common than among the others, and conversely that among those with cancer active tuberculosis was comparatively rare. He concludes that the two diseases coincided less often than would be expected if they are entirely independent of one another.

TREATMENT OF DRUG ADDICTION

Dr. Alexander Lambert, formerly professor of clinical medicine at Cornell University, has described in a paper before the Harvey Society his experience extending over 40 years in the therapeutic care of alcohol and other addicts.[1] He defined the drug habit as the habitual use of any drug for avoiding the emotional strains of life that were too intense for the personality to support.

He first considered hypnotics taken to relieve sleeplessness. One of the oldest and best was chloral hydrate; it had, however, the peculiarity, especially in old people, of causing sleep-walking in the middle of the night. It sometimes formed a habit, but since it was often used in combination with bromides, it was the latter that, if persisted in, produced a deterioration in the normal judgment of the patient.

The commonest hypnotics to-day were the barbiturates. Some patients were easily poisoned by them, and they produced a much greater injury to the personality and a more severe and lasting deterioration than morphine or the other opiates. The physician should be alive to the fact that changes of disposition in a patient might be due to the drugs given and not to the disease. Sodium amytal appeared to be a very favourite form of hypnotic, but on first waking there might be a clouding of consciousness. He thought picrotoxin was an excellent treatment for severe barbiturate poisoning; it stimulated respiration and the vasomotor system through the medullary centres. Intravenous glucose and insulin were valuable for patients who were in coma. In the recovery stage from chronic or acute poisoning the instability of the autonomic nervous system was greatly calmed by a new drug sold under the name of rossium (diphenylmethylpyrazonyl, containing a double molecule of antipyrin). A new type of hypnotic which was proving valuable was composed of combinations of carbamide known as Bromural and Sedormid.

The treatment of alcoholic patients consisted first in detoxicating the patient and putting him to sleep; and he believed that rossium was extremely valuable in quietening their nervous excitement.

THE MORPHINE HABIT

Discussing morphine addicts Dr. Lambert said that some 13 per cent. only were of normal personality, a large number showing a tendency towards dementia præcox. Members of the manic-depressive group, because they were more in touch with existence,

[1] New Eng. Jour. Med., July 9th, 1936, p. 72.

were not so susceptible. The recurrent type of manic psychosis, however, provided a large number of periodic alcoholics, for they drank to keep up their excitation as the manic stage began to subside. Those who took opiates for physical pain were in a different category, and were always anxious to give up the habit. There were many peculiarities in acquiring the morphine habit which had defied explanation. The ease of withdrawal depended upon the length of time of the addiction and very little on the amount that was being taken. It was interesting that babies of addict mothers not infrequently showed at birth the need for morphine and died unless it was given; they would live and thrive, however, on small doses which should be kept up regularly until they were old enough to stand withdrawal, after which they would be perfectly healthy.

Dr. Lambert then mentioned various theories of morphine addiction. He thought that the allergic theory of Ostromislensky provided the best hypothesis. According to this the withdrawal symptoms of morphine were a form of anaphylactic shock. Matsuda had found that antipyrin prevented anaphylactic shock in guinea-pigs, and Ostromislensky prepared the double molecule of antipyrin that he called rossium and tried it on human beings. It proved to be one of the best preparations for reducing withdrawal symptoms of morphine, and clinically it was an excellent analgesic. Its action was most probably on the sensory nerves of the sympathetic system, and it appeared to preserve the normal equilibrium between the sympathetic and the parasympathetic.

Dr. Lambert then discussed the findings of the Mayor's committee on drug addiction appointed in New York City in 1928, of which he was a member. The committee studied the action of drugs in relieving the withdrawal symptoms of morphine. One of the most successful and least painful was by increasing the amount of codeine and simultaneously reducing the morphine; this, however, required four to six weeks in hospital, and sometimes resulted in a codeine habit. He had used rossium in 75 cases and found that it successfully reduced the withdrawal symptoms and the period of hospitalisation more than any other.

Dr. Lambert, in conclusion, pointed out that it was only after successful withdrawal that the real cure must begin; this consisted in actively treating the psychological distortion which had caused the morphinism or alcoholism.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.

WEDNESDAY, Sept. 16th.—Noon, clinical and pathological conference (medical). 2.30 P.M., clinical and pathological conference (surgical).

THURSDAY.—2.15 P.M., operative obstetrics.

FRIDAY.—2.15 P.M., department of gynæcology, pathological demonstration.

Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics, obstetrical and gynæcological clinics or operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Sept. 14th, to SATURDAY, Sept. 19th.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—BROMPTON HOSPITAL, S.W. 5 P.M., M.R.C.P. course (twice weekly). PLASTIC SURGERY. Wed. and Thurs., course in plastic surgery.—INFANTS HOSPITAL, Vincent-square, S.W. Mon., Tues., Wed., and Thurs., 8 P.M., primary F.R.C.S. anatomy and physiology course.—MILLER GENERAL HOSPITAL, Greenwich, S.E. Sat. and Sun., course in general surgery.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, Sept. 15th.—4.15 P.M., Dr. Crighton Bramwell: Heart Disease and Pregnancy.

FRIDAY.—4.15 P.M., Mr. W. R. Douglas: Demonstration of Surgical Cases.

Appointments

HEPPLE, N. V., M.D. Durh., D.P.H., B.Hy., has been appointed Assistant Medical Officer of Health for Walsall.

*IMRIE, J. A., M.D. Glasg., F.R.C.S. Edin., Physician to the Police Force of Glasgow.

KEOGH, CHARLES, M.B. Belf., F.R.C.S. Eng., Hon. Assistant Surgeon to the Ear, Nose and Throat Department of the London Hospital.

MCKEE, G. K., F.R.C.S. Eng., Surgical Registrar at the Sheffield Royal Hospital.

MORRIS, W. M., F.R C.S. Edin., Hon. Surgeon to the Ear, Nose and Throat Department of the London Hospital.

*PERROTT, E. A., M.B. Lond., D.P.H., Assistant Medical Officer of Health for Burton-upon-Trent.

PONDER, C. W., M.D. Lond., D.P.H., County Medical Officer of Health for Kent.

PURDIE, A. W., M.B., F.R.F.P.S. Glasg., M.C.O.G., Resident Medical Officer at the Isolation Hospital (Queen Charlotte's Maternity Hospital), Hammersmith.

*ROSS, THOMAS, M.B., D.P.H., Deputy Medical Officer of Health for Burton-upon-Trent.

SHANLEY, G. H., L.M.S.S.A. Lond., Assistant School Medical Officer for Durham County.

SINCLAIR, A. C., M.D. Belf., D.P.M., D.P.H., D.M.R.E., Deputy Medical Superintendent at the Dorset Mental Hospital, Dorchester.

YOUNG, J. H., M.B., Assistant School Medical Officer for Wolverhampton.

Manchester Royal Infirmary.—The following appointments are announced:—

LUXTON, R. W., M.B. Manch., M.R.C.P. Lond.;
PARKINSON, J. S., M.B. Manch.;
SIMPSON, THOMAS, M.B. Leeds;
HOWAT, H. TAYLOR, M.B. St. And.; and
GRIFFITHS, D. LL., M.B. Manch., F.R.C.S. Eng., Resident Surgical Officers.

* Subject to confirmation.

Births, Marriages, and Deaths

BIRTHS

CHARLTON.—On August 30th, at Ditchling, Sussex, the wife of Dr. P. H. Charlton, of a daughter.

GATHORNE-HARDY.—On August 31st, at Aldeburgh, the wife of Dr. the Hon. A. Gathorne-Hardy, of a son.

LAMBERT.—On August 22nd, 1936, at Mussoorie, India, to Gwendoline Mary (née Linsley), wife of Captain D. P. Lambert, M.D., D.T.M. & H., I.M.S.—a son.

LEWIS.—On Sept. 3rd, at Exeter, the wife of Dr. Walter Lewis, of Bude, of a son.

LODGE.—On August 29th, the wife of R. Lodge, F.R.C.S., of Leicester, of a daughter.

MILNER.—On August 31st, the wife of Silvanus M. Milner, F.R.C.S., of Manchester, of a daughter.

DEATHS

DALTON.—On August 29th, from heart failure, Godfrey Christopher Dalton, M.B. Edin., of Benoni, Transvaal.

MOYNIHAN.—On Sept. 7th, suddenly, at Carr Manor, Meanwood, Leeds, Berkeley George Andrew, first Baron Moynihan of Leeds.

STURTON.—On Sept. 4th, at Norwich, the result of an accident, Clement Sturton, M.B. Camb., F.R.C.S. Eng., of Kettering, aged 36.

TAYLOR.—On Sept. 2nd, at Torquay, Richard Stanley Taylor, M.D. Camb.

TUCKER.—On Sept. 3rd, at Welwyn Garden City, Donald Leslie Tucker, M.R.C.S. Eng., aged 43.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

SPITTLESEA ISOLATION HOSPITAL, LUTON.—The Mayor of Luton, on August 25th, opened two new ward blocks at this institution. This extension raises the accommodation of the hospital to the standard required for a town with a population of 90,000.

SCARBOROUGH'S NEW HOSPITAL.—The new Scarborough hospital, which the Duke of Kent is opening on Oct. 23rd, is now nearing completion. It is built in the form of an H, the southern wings being devoted to the public wards, the northern to kitchens, operating theatres, and the administrative section, and the cross-piece containing the private wards. The grounds extend to about half a mile in circumference and are laid out in gardens. At present there is accommodation for 140 beds, but the administrative section has been designed for twice that number. The hospital will cost £130,000.